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THE FAR EASTERN REVIEW

VOL. VIII.—No. 10. MANILA AND SHANGHAI, MARCH, 1912. 25 cents, U. S. Cy.

Japan's Mining Industry

◆

The World's Tea Trade

◆

America's Export Trade

Sir **FREDERICK JOHN DEALTRY LUGARD,**
G. C. M. G., C. B., D. S. D., Governor of Hongkong, Recently Appointed
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Far Eastern Engineering and Industrial News

Hongkong and Shanghai Banking Corporation

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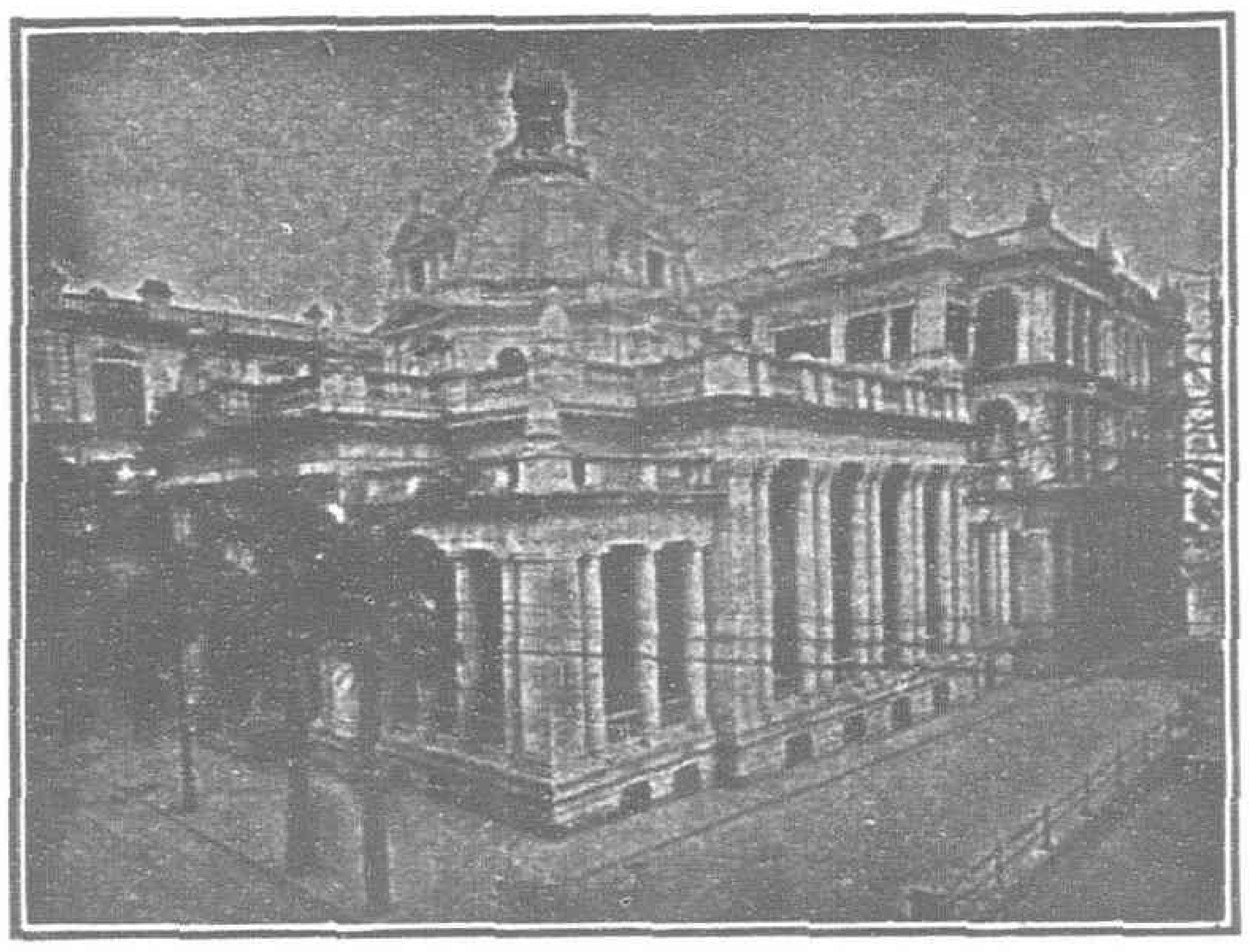

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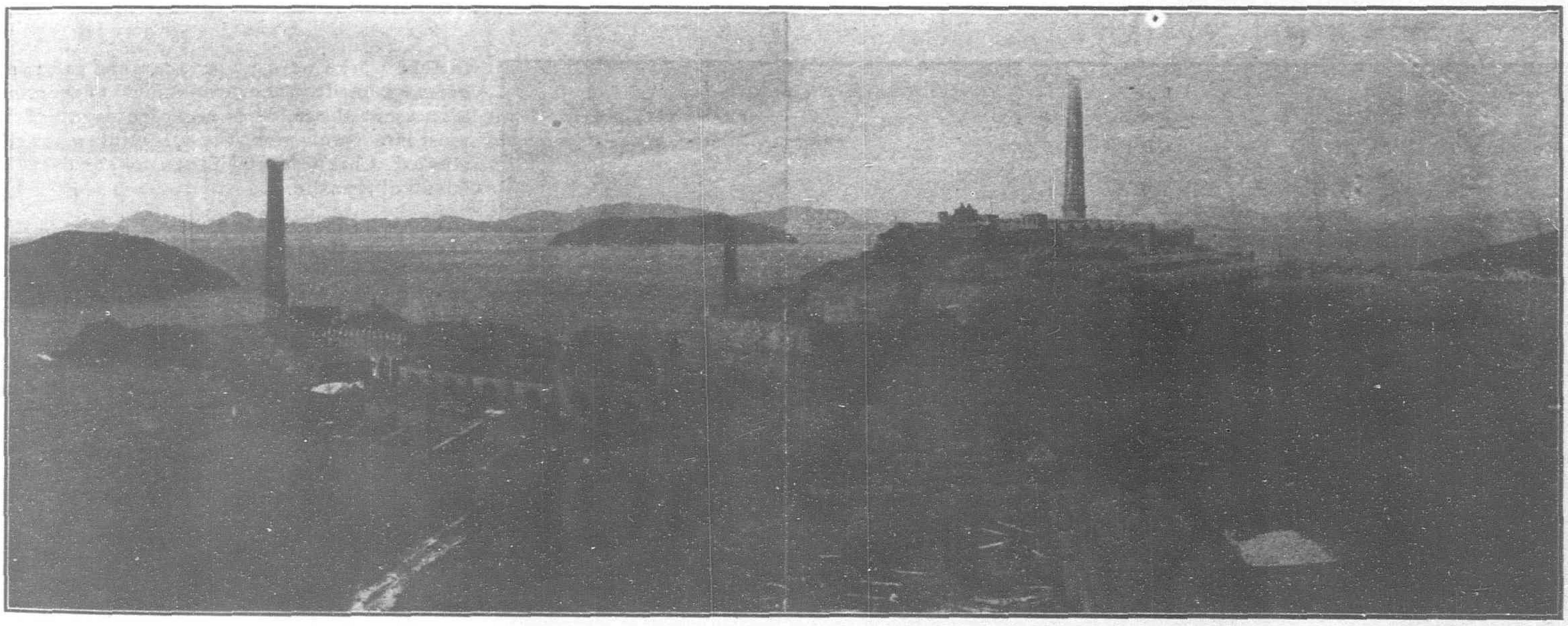
THE FAR EASTERN REVIEW
COMMERCE ● ENGINEERING ● FINANCE

VOL. VIII. MANILA, P. I., SHANGHAI, AND YOKOHAMA, MARCH, 1912 No. 10.

THE MINES OF THE ORIENT

THE SUMITOMO PROPERTIES, JAPAN

Among the various private business enterprises in Japan, few can boast of a larger scale or a sounder basis than the firm of Sumitomo. The firm has its main headquarters at Kitahama, Osaka, known as the Sumitomo General Head Office, which exercises a control over all the concerns of the firm. The principal enterprises undertaken by the firm are mining, banking, and warehousing, as well as copper and steel manufacture.



THE SHISAKAJIMA SMELTING WORKS OF THE SUMITOMO BESSHI COPPER MINES

BESSHI COPPER MINE.

History.—The Besshi Copper Mine was discovered in 1690, and has ever since been worked by the Sumitomo Family. About the year 1868 advanced European methods were introduced, which have resulted in the gradual increase of the output. The Besshi Mine at present ranks among the most important copper mines of Japan, belonging to the same category as the Ashio and Kosaka mines. The mine is located in Iyo Province, in the northwestern part of Shikoku, an island facing the Main Island, across the Inland Sea. It is from 3,000 to 4,000 feet above the sea level, and about 12½ miles distant from the coast.

Geological Formation and Mining Equipment.—The geological formation of the mine is crystalline schist, consisting of quartzsericites and chorite rocks, between which is found the ore deposit, all of one kind. The length of the ore-deposit is 5,000 ft. and its width ranges from 2 to 25 feet, the deepest part at present being 2,000 ft. from the outcrop. The dip is in a northeasterly direction and on the whole regular. The total area of the mining concession is over 6,480 acres. The principal ore is cupriferous iron pyrites containing an average of 4% of copper. There are 10 levels parallel to the bed from No. 1 to No. 10, the total length of which amounts to 43,000 ft. An inclined shaft has been sunk in order to facilitate the elevation of the ore and transportation of the stays, being connected with each of the levels at several points. Besides, there are two tunnels of 3,300 ft. and 6,000 ft. in length respectively. The ore produced daily is sent down to Niihama, where the main office of the mine is located, by means of aerial tramways and light railways specially laid for the purpose by the Sumitomo Firm and thence to Shisaka-jima Island, nine miles off Niihama where the metallurgical works are erected. Formerly the ore was roasted by means of stalls at Besshi and Kadoishihara, and the whole process of smelting and refining was carried on at Niihama by means of water-jacket-blast-furnaces and reverberatory furnaces. In 1904, however, the entire reduction plant was transferred to Shisaka-jima Island, and since then all the operations have been carried out there. The new Shisaka-jima Smelting Works is one of the most modern in existence, both in design and equipment. Besides the ordinary method of roasted ore smelting, a new process of raw ore smelting or pyrite smelting has been adopted with very satisfactory results. The refined copper of Besshi contains the least quantity of metallic impurities, and is specially remarkable for the entire absence of arsenic and antimony. According to the analytical certificate issued in 1902 by Mr. F. Claudet, the noted assayist of the Bank of England, the refined copper of Besshi is of 99.955% in tenor, while in the same year H. R. Merton & Co., Ltd., London, certified it at 99.9%. The refined copper is made into ingots, some of which are sent to the Sumitomo Copper Works in Osaka; but most of them known as "K. S. Ingot, Japan," are supplied to the Japanese and foreign markets. The refined copper is gaining a high reputation and is regarded on the London market as equal to the B. S. brand.

The annual output of the ore from the mine ranges from 200,000 tons to 210,000 tons, and the annual output of refined copper exceeds 6,000 tons, and is still increasing.

As to the motive power used for the mining operations and transportation, steam has almost been superseded by hydro-electric power, which was first introduced in 1904. The total capacity of the motive power is estimated at approximately 6,100 horse power and 1,600 kilowatts. The conveyance of the ore and provisions between Niihama and Besshi is undertaken by two private railways with a total length of ten miles and three aerial tramways, two of 5,200 ft., and one of 12,127 ft. in length. The firm owns a large fleet consisting of one tug boat and eighty sailing vessels for conveying the ore from Niihama to Shisakajima Island. The firm also owns 3 steamers which are used for the transportation of passengers, copper, and other freight; they ply between Osaka, Kobe Onomichi, Niihama, etc. For the conveyance of coal from Kyushu, a fleet of sailing vessels is employed, these having their anchorage off Niihama. Communications between the different offices is greatly facilitated by an excellent telephone system, the number of telephones set up amounting up to 249, and the total length of wires reaching about 145 miles. Besides, a submarine cable is in use between Niihama and Shisakajima Island. Post and telegraph offices are also established in the mine. Among other accessory enterprises may be mentioned the manufacture of the coke necessary for the works.

There are machine shops for making and repairing machinery and mining tools. Meteorological stations are established at important places. The importance of reafforestation in connection with the mining industry was early observed by the firm, and has lately been systematically undertaken. The total forest area owned by the firm amounts to over 34,194 acres, while the State forests in the neighborhood leased to the firm exceed 42,011 acres.

The firm also provides hospitals, schools, and houses for the benefit of the miners and employes leaving nothing undone for the proper protection of the workers and for the promotion of their comfort, as well as for the education of their children. The principal among the awards received at the various exhibitions are as follows:

First Prize for Progress at the Fourth National Industrial Exhibition, 1895.

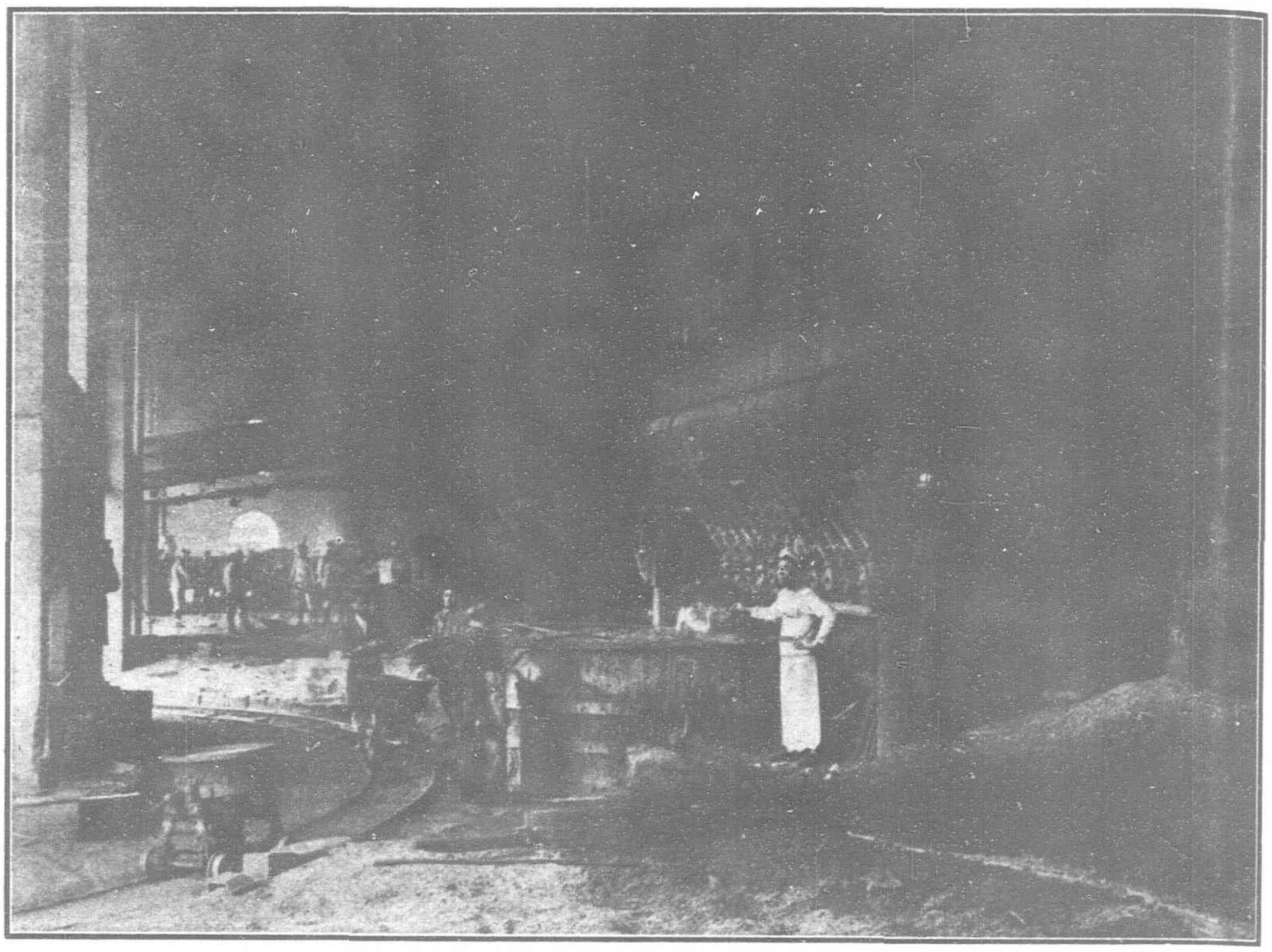
Gold Medal of Honor at the Fifth National Industrial Exhibition, 1903.

The following are the principal officials in charge of the business of the mine:

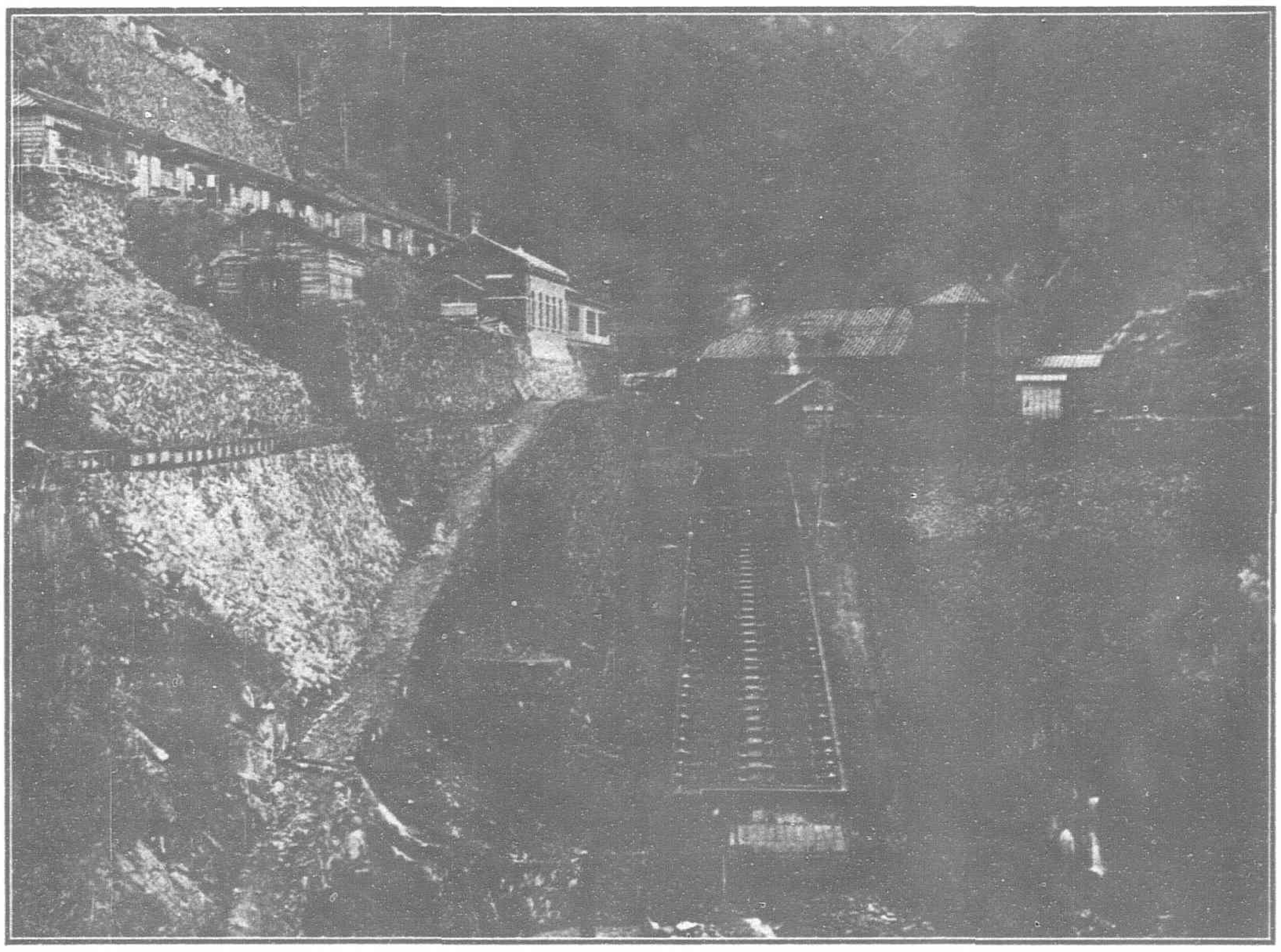
Manager: M. Kubo, Esquire; Sub-manager, and Chief Engineer of the Mining Section: S. Maki, Esquire; Sub-manager: J. Matsumoto, Esquire; Chief Engineer of the Metallurgical Section: K. Nakamura, Esquire.

Wakamatsu Coal Department.—This department engages in coal mining and the coal trade. The mine which is now being worked is the Tadakuma Colliery in the Kaho district, Chikuzen province. The colliery was taken over by the firm in 1894 and it has since been greatly improved, resulting in a considerable increase of the output. At first the 3 feet and 5 feet seams of the No. 1 pit were excavated, and in 1896 a second shaft was sunk with the object of excavating the 3 feet and 4 feet seams which were known to exist lower down, but the latter operations were discontinued in 1906. A third shaft was sunk in 1900. In 1905 further works were undertaken and great progress was made in the development of the mine. At present the mine is regarded as one of the most important among the coal mines of the celebrated Chikuzen and Buzen coal fields in the island of Kyushu.

The total superficial area of the mining concession is at present 1,076 acres. There are nine coal seams, the most worked being the 3 ft. and 5 ft. seams. The quality of the coal is excellent, and ranks as first class Chikuzen coal The appliances installed at the mine are of the best and latest patterns. The hands employed, including both miners and general laborers,



BLAST FURNACE AT SHISAKAJIMA SMELTING WORKS OF THE SUMITOMO FIRM.



SUMITOMO BESSHI COPPER MINES: TONARU CEMENTATION PLANT NEAR THE THIRD ADIT MOUTH.

MR. KICHIZAYEMON SUMITOMO, PROPRIETOR OF THE SUMITOMO FIRM.

number 2,152. The output for 1909 was 216,924 tons. The coal is supplied to various governmental offices and arsenals, and spinning companies and coke manufactories, while no small portion is consumed by the firm itself. The office of the Department is located at the port of Wakamatsu, Fukuoka Prefecture, and attends to the business connected with the sale of the product.

The manager in charge is Y. Yoshida, Esquire.

Copper Rolling Works.—The office and main works of this department are located at Itchome, Ajikawa-dori, Osaka, with branch works at Tamaye-cho in the same city. The works were originally established in 1897, when the copper-rolling factory of the Nippon Seido Kabushiki Kaisha (Japan Copper Refining Co., Ltd.) was purchased by the firm, the operations being confined to the manufacture of plates, rods, bars, wires, etc., of copper and its alloys, the material used being chiefly the product of the Sumiyomo Besshi Mine. In 1900, the factory of the Osaka Seido Kabushika Kaisha (Osaka Copper Refining Co., Ltd.), was also taken over, and converted into a branch factory. In the same year was started the manufacture of zinc sheets and aluminium sheets and wires.

Later it was found necessary to make further extensions, and in 1908 the manufacture of insulated wires and electric cables was commenced Since 1909, solid drawn copper and brass tubes have been added to the list of the manufactures of the works. Another factory is now under construction for turning out copper plates of large size, and the works are deemed to be the largest of the kind in Japan.

The present works of Ajikawa spread over 7 acres, the buildings covering 3 acres. They are equipped with machines of the latest type. The laborers employed number over 500.

The products of the works are utilized for various purposes in Japan such as electrical undertakings, building, ship-building, engineering, etc. The arsenals of both Navy and Army are the best customers of the works. In view of the great development of electrical enterprises, it is expected that the demand in that direction will be largely augmented in the near future. A certain amount of direct export to China has been tried, but the demand being at present limited while that of the domestic market is rapidly increasing, the export business has been abandoned for the present. The awards gained at various exhibitions are as follows:—

Competitive Exhibition of the Manufactures of Osaka, 1900. Diploma.

Paris International Exhibition, 1900. Gold Medal for Copper Plates.

Paris International Exhibition, 1900. Silver Medal for Copper Wires.

The Fifth National Exhibition, 1903. Silver Medal of Honor.

The Victory Commemoration Exhibition, 1906. Special Prize, Gold Medal.

The principal officials of the works are as follows:

Manager: K. Yukawa, Esquire; Sub-manager: K. Honjo, Esquire.

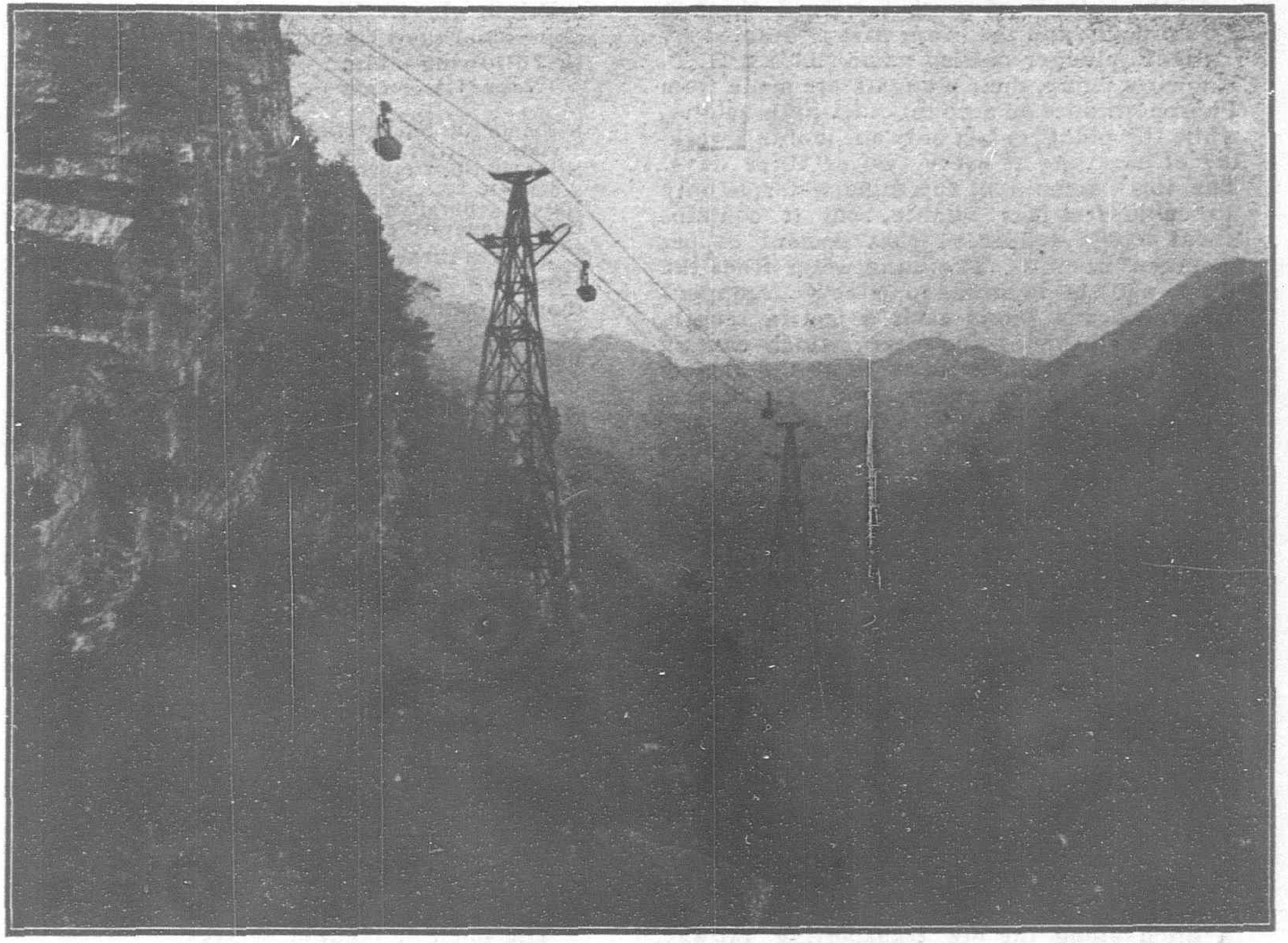
Proprietor and Staff.—Mr. Kichizayemon Sumitomo, head of the firm, controls all the undertakings, assuming unlimited responsibility and generally supervising the operations. The unity of the various departments is maintained by the Director-in-Chief, who takes charge of general affairs, while the chief auditor supervises the finances and business undertakings.

The proprietor and the principal officials of the head office are as follows:—

Proprietor: Kichizayemon Sumitomo, Esq.; Director-in-Chief: Masaya Sudzuki, Esq.; Director and manager of Sumitomo Bank: Kinrichi Nakada, Esq.; Director and manager of Sumitomo General Head Office: Kanrichi Yukawa, Esq.

Director and Manager of Sumitomo Besshi Copper Mine: M. Kubo, Esq.; Chief Auditor: R. Fujio, Esq.

(From Japan's Industries)



AERIAL TRAMWAY AT THE BESSHI COPPER MINES

THE BESSHI COPPER MINE.

This is a champion among the copper mines of the so-called bed type in Japan, according to 1910 official reports. It has been possessed by the Sumitomo since its discovery in 1690. From that year to the end of 1909 the total copper production amounted to 1,922,560 long tons, still the ore reserve left is said to be beyond estimate. The mine is situated on the watershed range of Shikoku, which is from 4,000 to 3.000 feet above the sea level. It is connected with Niihama by railway. From Niihama, several steamers 67.756 total tonnage sail to Onomichi, Osaka, or the islet of Shisakajima; the last is at present used for the smelting plant.

General geology is chlorite, graphite and piedmontite schist of which the former two are mostly developed. Quartz schist runs along both sides of the deposit which in some cases transits into sericite schist or piedmontite schist. Besides them amphybole schist, eklogite and also several dykes of serpentine containing cromite crop out at some distance from the deposit on the hanging wall side. A bed of cupriferous iron pyrite runs between the above rocks, striking at 120 deg., dipping at 45 deg. northward in the upper level and at 60 deg. in the lower horizon. The bed is over 6,000 feet long, 4 to 30 feet wide and the present deepest part is 2,150 feet deep along the dip. In the bed two swells seem to course from the upper west part to the lower east corner, and sloping at about 45 deg. There are several step faults in the eastern part. The ore may be classified into three kinds, i. e. 1 deg massive pyrite containing about 3% Cu, 2% SiO_2 2 deg. Banded ore with the country-rock containing 4% Cu, 30% SiO_2 3 deg. enriched ore. The average tenor of the ore during the last three months is 3 8% copper, 33 3% sulphur and 35· 3% iron.

It was formerly worked from the upper horizon seeking after the rich part. A French engineer designed a shaft in the year of 1874. It was sunk at 49 deg. inclination along the foot-wall of the bed from a part of outcrops on the south side of the range. A 300 H. P. steam hoisting engine was set up there, fit for winding up from a depth of 3,000 ft. The third adit was driven in a level 2.459 feet above the sea level which is in the same horizon as the ninth level. It is 5,936 feet long and 11′ by 10′ large, and also serves as a drainage level. There is in addition one drainage level which is 3,560 feet long. This level is in same level as the fourth level. Besides these, one more adit of 13′ × 10′ will be started in the near future from Hateba, the end station of the lower railway. This is estimated to be 15,865 feet long and will be connected with the eighth level by a shaft about 1877 feet deep, which will be a 16′ 6″ dia. brick-walled one and started from a point in the hanging wall 550′ apart from the bed. The compressor for rock drills is going to be set at Hateba. This will be perhaps the last adit of this kind and after the completion of this work with that of motive power, the production per day will be increased to over 1,000 long tons. The tenth level is the deepest one which is in 1/721 feet deep. Each level is 7′×7′ size, has a one-hundredth gradient and one line of 18 lbs. rails of 20½″ gauge. The total elongation of the chief levels is 9 miles 70 chains, that of the rail is about 13 miles and that of the inclined shafts except the above mentioned ones is about 1 mile. At every 30 feet a chute is made and at every 10 chutes one winze; and overhand-stoping is adopted as the method of mining, its breast being 7 feet high, the sole 15 feet and its width from 3 feet to the width of the deposit. Boring is chiefly done by hand, yet rock drills applied in excavation of broad beds and level drivings. There are fourteen Schram 3¼″ rock drills, fifteen Leyner's 2 5/16 inches hand drills Pneumatic company, driven by three Rands, three water Leyner, one Schram compressors of a total of 750 H. P. Blasting was first adopted among us in this kine in 1867 when gun-powder was used with fuses made of a sort of bamboo. Ores excavated from upper four levels are brought down to the rock-house at the mouth of the first adit in ox cars. Ores from lower levels than the 4th are collected in the ninth level from whence they are brought to a rock house near the third cross cut by electric cars. The hauling engines at the eighth level is moved by a 38 H. P. compressed air, which will be replaced by 120 H P electric hoist in the near future. The smaller windlass will not need description. The electric locomotives are 3 ton Westinghouse ones which run on 20 lb. rails. As to timbering they use chiefly cypress or pine. There is nothing particular as to ventilation and illumination.

All the water is at present drained through the third adit and the lower part is drained by 5 H. P. plunger sinking pump and a 5 H. P. Knowle's pump, their plungers are made from Phosphorbronze on account of its high acidity, while the plungers last only one month's working of one time at every two or three days. The total amount of the mine water is only 40 cubic feet per minute, but it contains about 0.02% copper so that cement copper is taken from it. The mine water from the third adit is induced to ninety decopperization wooden boxes each 8 feet in length, 3 feet wide and 1 foot-deep, which contain scrap iron and their slope is at the rate of 1:5.5. The average production of the precipitate is 35 tons per month which contains 50% Cu. The water which has passed through these boxes is conducted by launder to another plant about 1,900 feet below which is made up of one hundred and fifty-two decopperization boxes each 12 feet in length, 8 feet in width and 4 feet 6 inches deep, sloping at 1/44. These boxes are arranged in four series, in each of which the water flows up and down. In this case scrap iron and coke are used as the precipitants, the former consumption being 23% of the precipitate produced. The precipitate taken is on the average fifty tons a month which contains 8% copper. The coke, in which the precipitate is absorbed, is produced to an amount of 200 tons per month which has 1% copper. All these products are sent to the smelting works at Shisakajima. The water after the above treatment is conducted to the sea by a ditch along the ore transporting railway.

The nature of these ores makes the dressing unsuitable so that merely sizing and hand separation are done in the rock houses. There are two rock houses at Kadoishiwara and Tonaru, the former being situated at the mouth of the first adit and the latter at that of the third adit, but after 1911 the whole ore will be dressed in the latter. In Kadoishiwara, about 200 long tons of the ore are treated manually from which 10% rubbish, 70% lump, and 20% smalls are produced.

The Tonaru rock house equipment consists of grizzlies, 1′ by 2′ Blake crusher, belt conveyors, etc., 50 H. P. motor being used as motive power. In this house about 450 tons are treated from which about an equal ratio of lump, fines and rubbish are produced.

The dressed ore from Kadoishiwara is carried by a 3 miles 33 chains long railway along the side of the steep mountain to Ishigasanjyo which is 2,762 feet above the sea level, the locomotive having 10 tons weight and 12 tons tractive force. Two courses of Haldy wire rope are placed from Ishigasanjyo to Hateba, an end station of the lower railway which is situated 518 feet above the sea level. The ore from Tonaru is conveyed by a Bleichhert double rope system aerial tramway to Kuroishi, a station on the lower railway which is situated 403 feet above the sea level. The lower railway is 6 miles 40 chains long. Seven locomotives of 8 miles velocity per hour and 35 tons tractive force run on this line. All these railway and aerial tramways were completed in June, 1893, while up to that time transportation has been done by tubs drawn by oxen for a run of 18 miles. At Niihama the ore is shipped in Japanese boats of 30 tons each which are conveyed in a series of 13-15 boats by a tow boat of 123 tonnage to Shisakajima. There are 81 Japanese boats and three tow boats. We shall here describe about the source of power, etc., except the matters concerning metallurgy, which will be treated later on as it is operated independently from the mining, etc. Besides the engine mentioned of the main shaft at the mine there are four Lancashire boilers of 21′ 6″ length and 8′ 3″ diameter; one 8 feet dia. 75 H. P. Pelton wheel drives a compressor at Tonaru. The other machines are driven by electricity which is generated at four stations. Two stand at Niihama, one at Hateba, and one at Otoshim which is situated between Tonaru and Hateba; in the three former electricity is generated by a steam engine and the last by a Pelton wheel. The specifications of the machines and their equipment may be seen from the following table:

Name of the stations	*Dynamos.* *number*	*Kilowatt*	*Voltage*
Niihama No. 1 generating station..................	2	180	11,000
Niihama No. 2 generating station......	1	110	3,300
Hateba generating station	1	110	3,300
Otoshi generating station	1	110	3,300

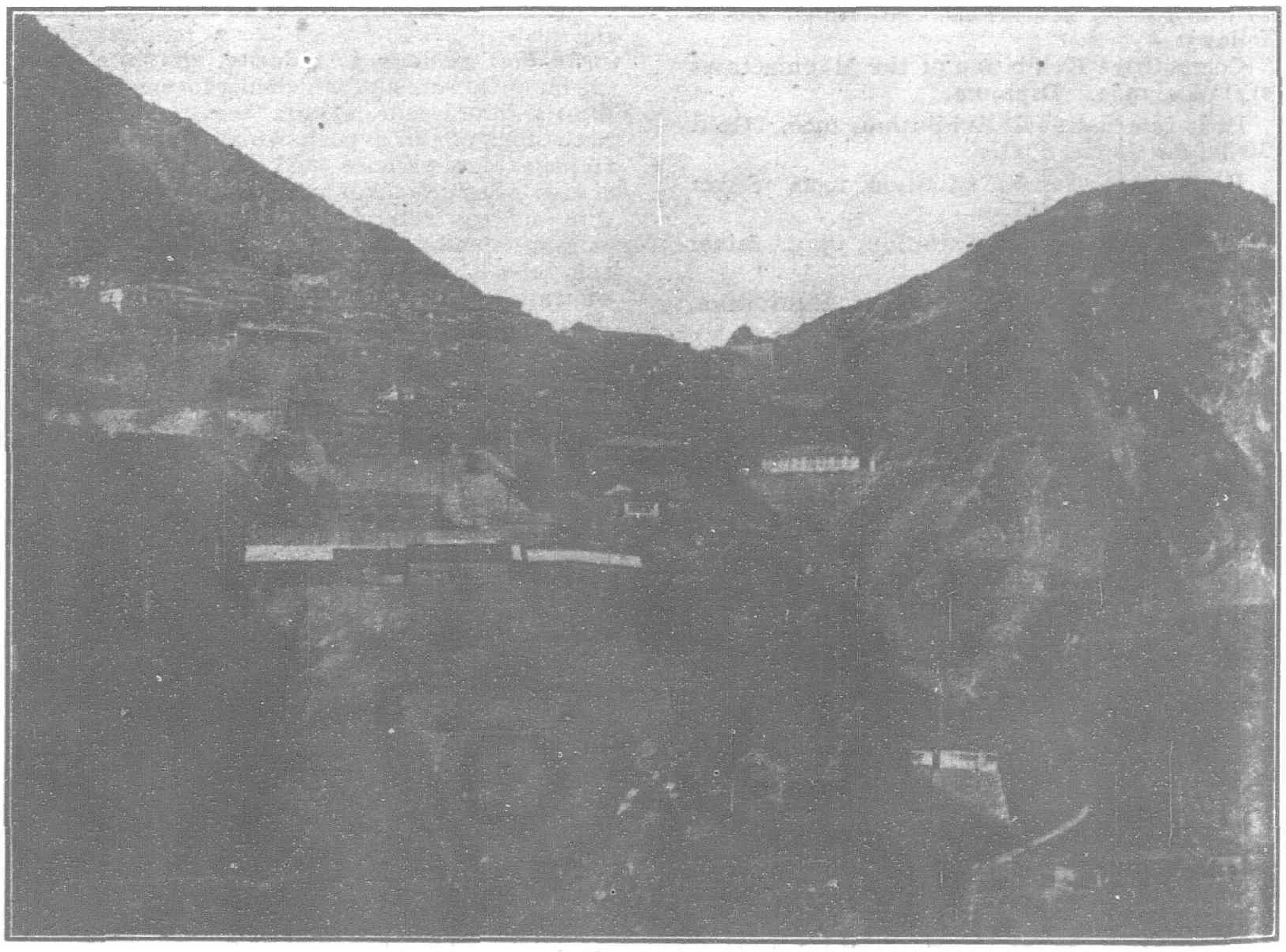
Besides these there are at the Niihama workshop two Cornish boilers of 25′ length and 5′ 6″ diameter and one 90 H. P. noncondensing engine and one 90 H. P. Schram's compressor. In the near future two 750 k. w. turbo generators will be put into active service. The steam for them will be generated by four Heine's water tube boilers of 170 lb. pressure per square inch. The proprietors are also attempting to set up a 6,000 H. P. generator at Ishigasanjyo which has 2,000 feet head and the water supply for power will be taken the ravines. There are 2,185 persons employed in the mining department.

Besides at Niihama, 1,922 men and 103 women are employed in workshops, etc. There are also 121 persons at the Nishinokawa branch mine; ores mined are as follows:—

Year	*Besshi mine. Long tons.*	*Nishinokawa branch mine. Long tons.*	*Total long tons.*
1904	132,974	2,903	133,877
1905	122,211	2,130	124.341
1906	131,017	2,224	134,241
1907	164.344	3,300	167,644
1908	192,634	2,661	196,243

The smelting plant at Shisakajima was erected at the end of 1904 at a cost of £253,750. The isle consists of four small ones situated 9.5 knots off the coast of Niihama, having 4,800 inhabitants who lead a most comfortable life, as the Sumitomo makes every provision for the convenience of the laborers such as amusement-clubs, hospitals, schools, etc. They propose treating the ore by pyrite smelting and then bessermerize the matter by convertors and make sulphuric acid. They are now examining the pyrite smelting and pot roasting. Both are said to have good results in spite of the unsuitable construction of the furnace for pyrite smelting as to the tuyere opening and the height of the charge. By pot roasting, the cost of the works may be lessened very much more than by briquetting by the brick making machine and in the near future one more ore smelting furnace will be fitted up for pyritic smelting. Fine ore from the mine is again sized by half inch grizzlies near the landing place of Shisakajima. Fines larger than half-inch are treated like lump ore, i. e. they are partly roasted and partly directly smelted in the blast furnaces, a 90 H. P. hauling engine of Robey & Co. carries the ore to the roasting plant, etc.

The roasting plant is placed at the north-east part of the island and covers an area of about 180,000 square feet which amounts to about two-thirds of the total plant area. There are 278 stalls of 30-37 long tons capacity arranged in steps along the slope of a hill from 42 feet high level above the sea to 130 feet high level, thus the effect presents a castle-like appearance at a distance. There are also thirty stalls in another place for use in case of emergencies. They are constructed with slag brick and stand back to back, having a common flue in the centre line; all of which lead to a 212 feet high, 14′ 6″ dia. chimney of brick construction placed on a level 145 feet above the sea level. The ore is roasted in them to 10% S in 40 days. Roasts from the stalls, placed above 42 feet high level, are brought to the ore bins at that level by self-acting planes, and in those bins the fines and lumps are separated. The former are used in briquet making. 20% of this and the finest raw ore are mixed with flue dust from ore and first matte smelting and then briqueted into common brick size by two or three common brick making machine driven by 20 H. P. compound wound motor. This machine has two stamps which drop 24 times per minute and has a capacity of 56 long tons per day. The briquets are smelted in a pyritic-smelting furnace, after being dried by the waste heat of the slag from the ore smelting furnace. Pot roasting was started in August 1908. One pot holds 5 long tons of fine, i. e. that amount can be put in it, but commonly it is operated at 70–80% of its full capacity. At first the ignition was performed with fine coke, while now it is done by hot slag bricks. One operation consists of four charges the blast being 45 mm. at the last stage and it takes about eihgt hours. The breaking of the sintered mass is performed by throwing the



SUMITOMO BESSHI COPPER MINES (GENERAL VIEW OF TONARU.)

Showing the chief Dressing Depots and some of the Miners' Cottages mass from the pot, which is kept 6 feet above the ground, upon twocast iron domes. The lump produced is 80-90% of the product and the sulphur content is decreased to 14% from 30 sulphur in the original charge.

At present one third of total ore is subjected to pyrite smelting and the remaining part is treated in reduction smelting, two or three in four blast furnaces are used for reduction smelting. These blast furnaces are of the same dimensions, they are rectangular water jacketed ones, 16 feet × 3.3 feet at tuyeres, having 12 back side tuyeres and 10 front tuyeres of 4 inches diameter. They are arranged in one line having long sides in same line; thus tapping is performed from the middle part of the long front side, the bottom of the furnace body sloping to that point at a rate of 1/32. The charge is done by shovels from only one long side and three 2.97 feet diameter sheet iron flues run up above the charge floor and discharge the waste-gas into a horizontal common flue running in the centre line of the furnaces. Each furnace is also provided with one more flue of the same construction which is to be used only in the case of blowing in or out. The chimney is 204 feet high and 13 feet 10 inches in diameter at the top and is not on a level 42 feet above the sea level. This chimney discharges gases from the matte smelting, bessemerizing and refining furnaces besides the ore smelting one. The matte from the ore smelting furnace flows through the jacketed spout into corresponding 10 feet dia. forehearth. All the jackets are of steel construction, only the tap jacket is made of copper, bronze or cast iron. The water for the jackets is taken from the sea by a Riedler double acting forcing pump, besides which there is one Gwynnes' centrifugal pump. The sea water pumped up is kept in a reservoir of 27,827 cubic feet capacity from which it is delivered to all the furnaces of ore and matte smelting.

(a) *Reduction smelting:*—The charge of reduction smelting consists of 4,750 lbs. roasted ore, 330-660 lbs. briquet of raw fines, 330-660 lbs. bricks of flue dust, 500-830 lbs. cupola slag, 330 415 lbs. silicious flux and 620-785 lbs. coke, sometimes cement copper of poor copper content being added to it. The silicious flux is gneiss brought from an island in the Inland Sea and its composition is 6.92% Fe_2O_3, 5.88% Al_2O_3 and 83 14% SiO_2. The capacity of one furnace in this smelting work is about 200 tons per 24 hours, using 0.81 lbs. of blast per square inch. There are seven Thwait-Roots No. 7 blowers, working at 300 revolutions per minute. They serve too for the blast of the matte smelting and are driven by a 320 H. P. Corliss engine. The slag from this smelting is composed by 36% SiO_2, 7% Al_2O_3, 47% FeO and 0.335% Cu. It flows out of a spout in the upper level of the forehearth whence it is carried on trucks to the sea shore one part of which is coveyed to the dump after utilizing its heat, another part is made into slag brick by covering them with straw ash after casting them into bricks. The matte is tapped eight times a day from two tap holes in the bottom of the forehearth to a multitude of sand moulds made in the beds where they are broken by hammers after cooling and are conveyed to the matte roasting plant. The matte has 28% Cu.

(b) *Pyrite smelting:*—The first matte from pyrite smelting contains only 13% copper, so that it is to be smelted again pyritically into a second matte of about 26% Cu before being subjected to matte roasting with the first matte reduction smelting. The pyrite smelting is at present performed in the same furnaces as in reduction smelting, so that the oxidation in the furnaces is insufficient, nevertheless the cost of working to produce a matte of the same tenor is cheaper than the reduction smelting. Thus it is the intention to replace the latter by the former.

The charge of pyrite smelting for ore is made up from 2,500 lbs. raw ore, 1,650 lbs. of raw briquets, 250 lbs. of the first matte of pyrite smelting, 500-830 lbs. of cupola slag, 250 lbs. limestone and 165-290 lbs. coke. The capacity of the furnace in this case is 150 long tons of raw ore, using 10 lbs. pressure blast. The first matte assays 12% Cu and the slag in this case contains 35% SiO_2, 4% Al_2O_3, 45% FeO and 0.2% Cu.

The charge of matte smelting is composed of 2,500 lbs. of first matte, 165-330 lbs. Atebuki slag, 165 lbs. pot-sinter, 500-830 lbs. cupola slag, 580-660 silicious flux, 125-165 lbs. limestone and 165-200 lbs. coke. On this occasion the furnace smelts 110 long tons of the raw matte with 1 lb. blast per square inch, producing 27% Cu. matte and slag containing 0.4% Cu, 32% SiO_2, 5 FeO. The limestone in the charge is also shipped to this place from an island in the Inland Sea and its analysis is 2.02% Fe_2O_3, 1.26% SiO_2, 0.52% Al_2O_3 and 53073% CaO.

Matte roasting:—There are fifty-nine stalls of a similar construction to those of ore roasting; they are built in a level 145 feet above the sea level, the waste-gas from which is delivered in the same chimney as the ore roasting, they differ from the ore roasting stalls in having four ignition holes arranged in two steps. Two ignition holes of the upper layer are first fired and seven days after that time the holes in the lower parts are ignited. The time for one operation is about three weeks. The roasted matte contains 10% S which is to be smelted again in cupolas.

Matte smelting:—There are four cupolas of the jacket and portable crucible type of which two or three are in working and the other in repair. They are 3 feet dia. at the tuyeres and have eight tuyeres of 3 inches dia. To each cupola, two reverberatory forehearths are equipped into which molten matte is directly tapped and in which converting or Atebuki is practiced. The reverberatories are 9 feet 1½ inches long, 6 feet 7½ inches wide at the widest part inside the hearth and have two 1¼ inches dia. tuyeres. The rich matte contains 64% Cu. The slag is returned to the ore smelting. The matte is tapped 7-11 times a day; as soon as it enters the reverberatories, a blast up to 15 lbs. pressure is employed and the floating slag is skimmed off after about one hour; when no more slag yields and bubbles issue from the surface, the blast is stopped and the temperature of the hearth is raised by adding a new charge of coal in the fire grate; 30 minutes after this time, blister copper is tapped from the bottom which is cast into molds on revolving plate. 9 long tons of rich matte are treated in this reverberatory for 18 hours. The blister copper contains 98.76% Cu. The blower for Atebuki is one Riedler's horizontal compound blowing engine which delivers 6,452 cubic feet of blast at 72 revolutions per minute, strokes of 42 inches and the blast can be raised to 15 lbs.

Besides the blister copper from the above mentioned, that from the Nishinokawa branch mine is also refined in this plant. There are two reverberatories (one is commonly in use) for this purpose. It has a 14.5′x8′ oval hearth and capacity of 15 long tons per operation. The refined copper contains 99 7 99.9% copper. They partly go abroad through Kobe and partly to the Sumitomo rolling mill at Osaka, where they are made into plate, bar, or wire.

There are twenty-six Haldy's coke-ovens of 7.4 long tons each and 80 H. P. electric coke pusher. The coal is from the Miiko and Karatsu, and 68% of the coke is preduced from the mixture of the coals, the gas being used in boiler heating.

There are seven Lancashire boilers of 7 feet dia. and 28 feet long. Besides the previously mentioned engine, the chief ones for other purposes are as follows:

No.	H.P.	Engine	Dynamo	Object
2	25	General Electric & Co. non-condensing dynamo engine.	General Electric's D. C. Compound 220 V.	Lighting
2	100	Intorle & Seymour & Co. tandem system	Bullcock & Co. D. C. Compound 220 V.	Miscellaneous

The number of laborers at the end of 1908 was 1,380 persons. The productions of five years are:

1904	9,443	long tons of refined copper.
1905	5,001	,, ,, ,,
1906	5,459	,, ,, ,,
1907	5,347	,, ,, ,,
1908	5,173	,, ,, ,,

EFFICIENCY RECORD OF THE LAUNCH "GLADYS"

The launch "Gladys," owned by Mr. P. A. Powers of New Smyrna, Florida, has done splendid towing and has given such good service that Mr. Powers recently wrote to Fairbanks, Morse & Co., as follows:

"We have just completed a 1,200 mile trip with one of your 7 H. P. engines in a 23 ft. launch, "Gladys," having towed a lighter 20×80 ft. loaded with gasoline drums 200 mile and making the trip in two days less time than any other boat on the run has made it and the other boats all have over 25 H. P. against our Fairbanks-Morse 7 H. P.

"We averaged on light running on this trip 3 quarts of gas to the hour, an average of 9 miles an hour. We towed 103 drums of gas on the large lighter from Jacksonville to New Smyrna a distance of about 175 miles, on 74 gallons of gas.

"We are more than pleased with this engine and do not think it possible that there is another engine made that can stand the hard work that this one can. There certainly is nothing on this water that can equal it and many of our friends are arranging to do away with their present engines and adopt a Fairbanks-Morse."

FOREIGN COMPETITION FOR LARGE PIPE CONTRACT

J. G. White & Company, Incorporated, of New York and San Francisco, have just purchased 124 miles of 12 inch steel pipe to be used by them in building a natural gas line for the Midway Gas Company in California. The pipe will weigh approximately 11,000 tons, and, with transportation, will cost approximately $600,000.

Quotations were asked from British, German, and French manufacturers, and the best foreign price was that of a British firm, which, exclusive of duty and freight, was approximately double that at which the contract was placed with the National Tube Company, a subsidiary of the United States Steel Corporation.

This indicates the remarkable resources of the United States for cheap production of steel and the advantages of buying this kind of manufactured material in the American market.

AUSTRO-HUNGARIAN ASSOCIATION

The Austro-Hungarian merchants of Shanghai have formed an "Austro-Hungarian Association" in China (Oesterreichisch-Ungarische Vereinigung fuer China in Shanghai), the object of the association being to further the Austro-Hungarian interests in China.

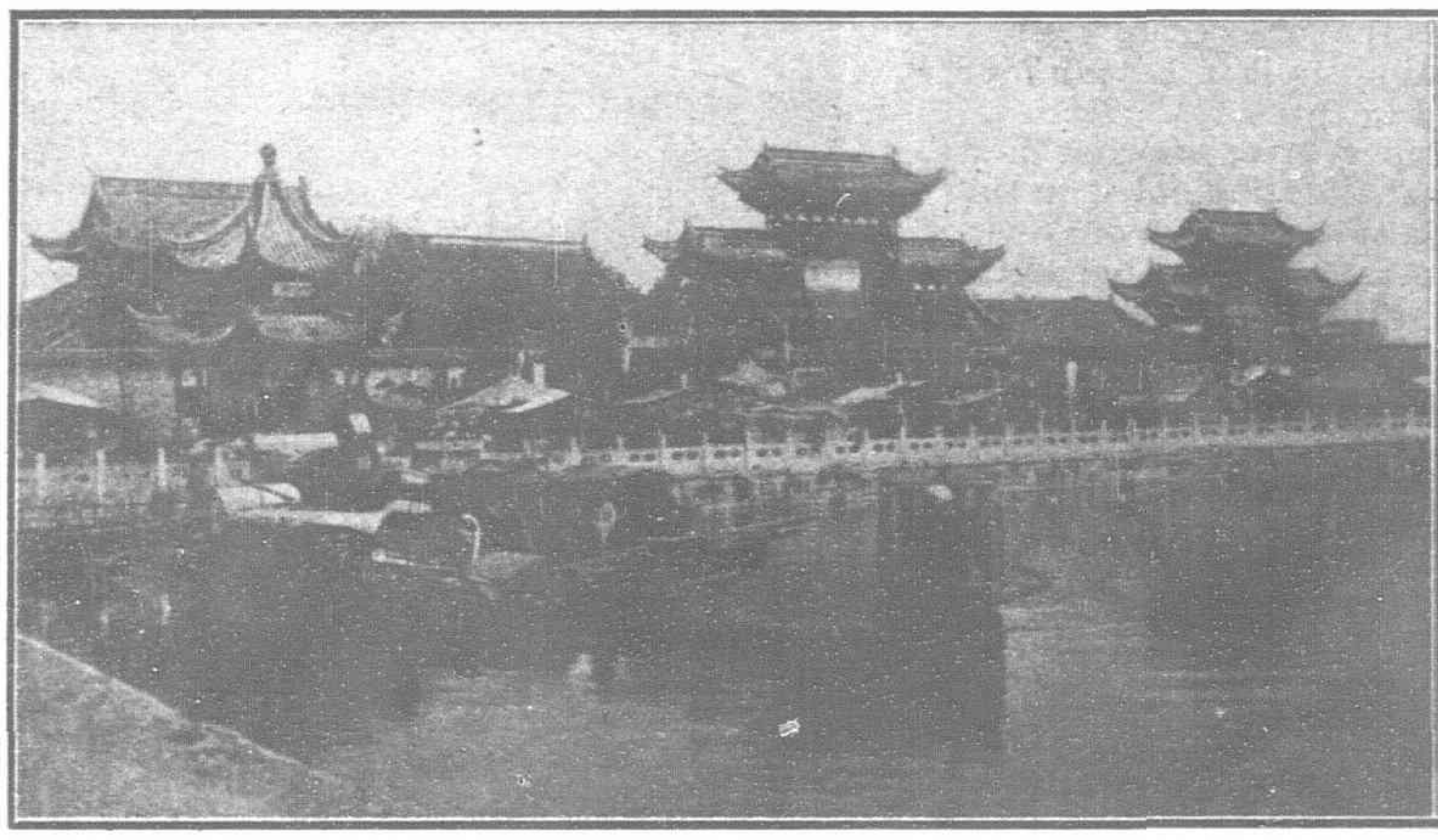
The following committee has been elected: L. Soyka, Kght. F. J. O.; J. Boch; Dr. O. Fischer, Hon. Secretary; B. Molnar; H. Kober. All correspondence may be addressed to Dr. O. Fischer, Managing Director of the Austro-Asiatic Trading Co., Ltd.

Engineering and Industrial Notes from American Trade Reports

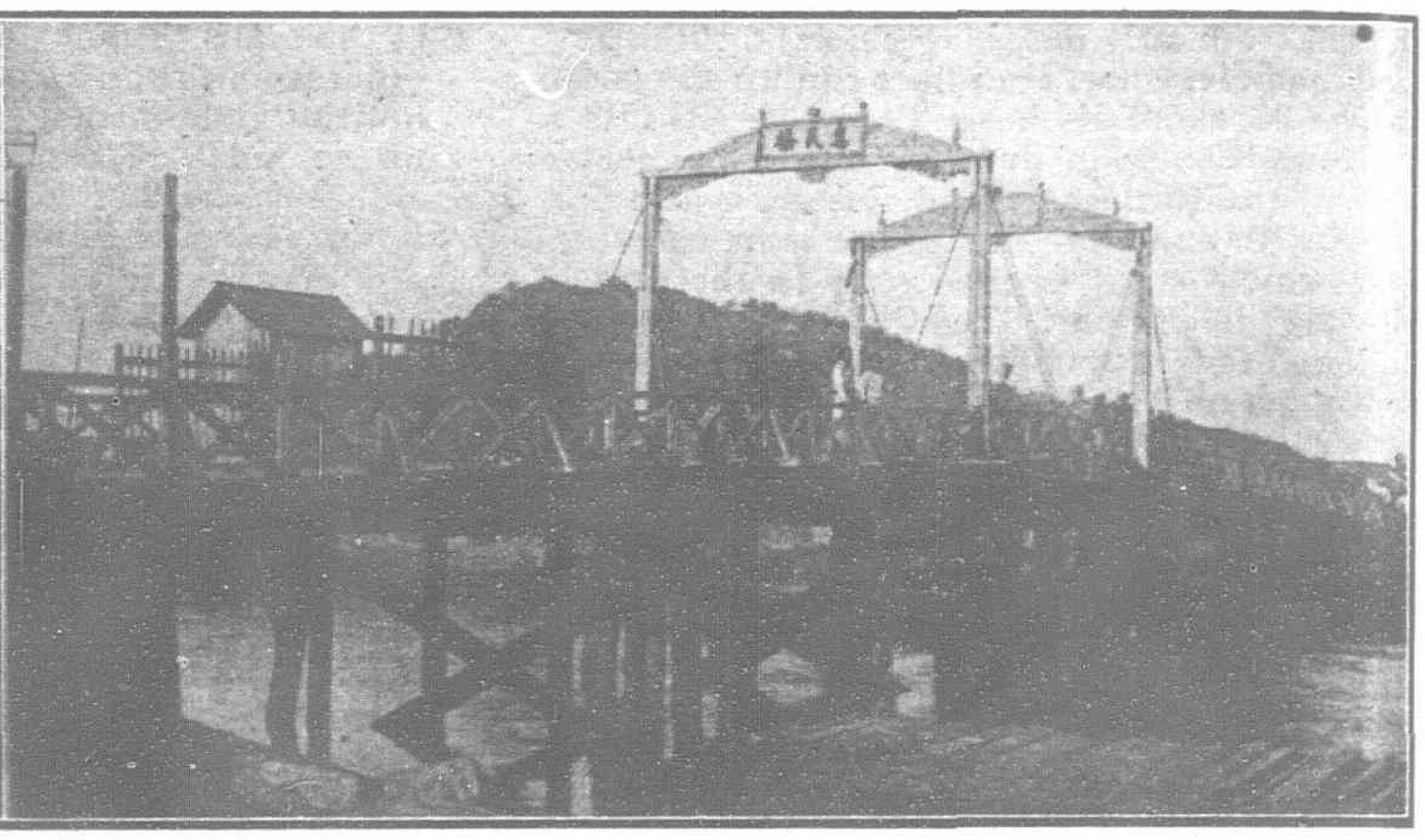
NANKING.

[By Vice Consul A. W. Gilbert.]

Prospective Machinery Market.—There is considerable agitation just now for the establishment of more modern factories in Kiangsu Province to consume the raw material now exported. This will probably create a special demand for milling and cotton machinery, etc. There are over 30 miles of macadam roads in Nanking which have been constructed without machinery of any kind; these roads are being lengthened annually, and machinery will probably be purchased for the work. Nanking has no waterworks or sewerage system worthy the name, but these will soon come and will involve the purchase of foreign machinery. Poor farms, primarily intended for the employment of the annual influx of famine refugees, are also being discussed, and if established ought to open a market for farming implements.



NANKING: VICEROY'S YAMEN



BRIDGE AT HSIAOKWAN

Tientsin-Pukow Railway.—Work on the southern section of the Tientsin-Pukow Railway was much hampered during the year by a succession of floods as the line passes through the part of Anhwei which was most inundated. This is not expected to interfere materially with the program of construction, although it has made the work more difficult. On September 1, 1910, construction trains reached the Hwai River at Linhwaikwan, 94 miles from Pukow. At the end of the year the rail head was at mile 200 and the principal bridges were completed, every portion of the line up to the junction with the northern section being in hand. On the Pukow side the railway authorities have filled in a considerable tract of land along the river front and erected godowns for stores and materials. It is here that the southern terminus passenger station and platforms will be erected. A wharf 300 feet long has been completed, of which ocean steamers have repeatedly availed themselves; two pontoons, each 200 feet long, and two hulks have also been completed.

This line passes through the fertile farming districts of Anhwei, the mining, grazing, and farming districts of northern Kiangsu and western Shantung, and the cotton belt of northwestern Shantung and southeastern Chihli. If likin stations are not established, as they are along the Shanghai-Nanking line, the result will be a paying traffic, and much of that trade which is now transported into the interior by antiquated means will be attracted to the new line.

Shanghai-Nanking Railway—Shipping in 1910.—The value of freight transported on the Shanghai-Nanking Railway during the year was $324,371, which was $254,870 more than last year, an increase largely due to the Nanking Industrial Exposition. The likin stations continue to prevent the line from being a paying venture. The exposition exhibits were exempt from likin and customs dues.

Famine, Pestilence, and Flood—Electric Lighting.—A foreign-trained native surveyor was engaged this year to survey the district around Antung in northern Kiangsu preliminary to recommending extensive reclamation works in the Hwai district and creating an outlet to the sea for the surplus waters which collect there annually. The usual epidemic of typhus fever spread through the districts and refugee camps, claiming more victims than the famine.

Electric lighting was installed in 1910, the first use of the plant being the illumination of the viceregal yamen on the evening His Excellency Chang Jen-chün entertained the American business delegates in September. Early in October light was available at Siakwan. The cost of installation of 16-candle-power lights is $1.75 per light, and the cost per unit is $1, a meter being connected with each installation.

TSINGTAU.

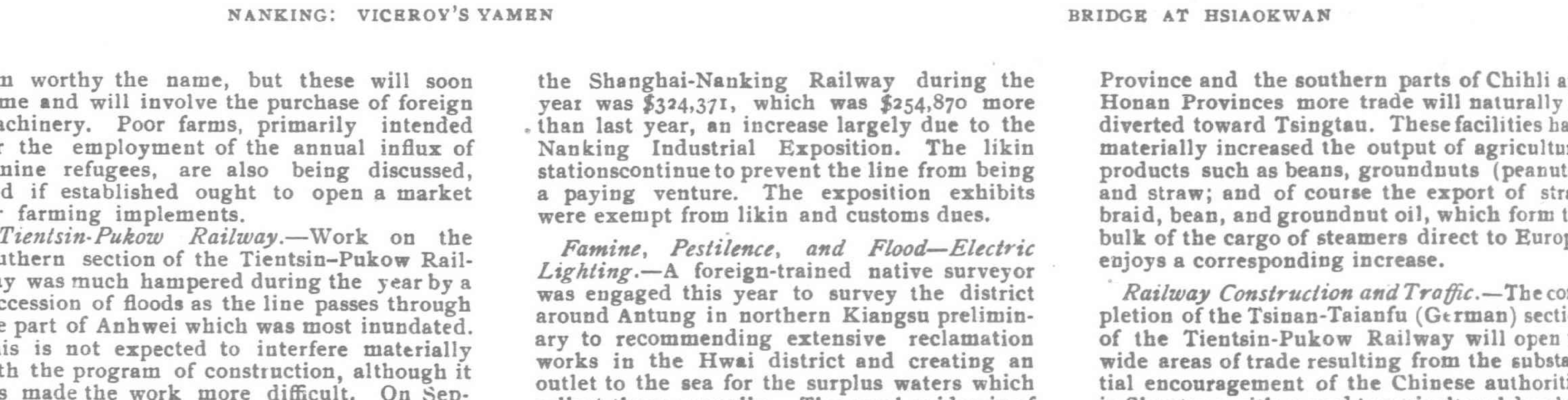
[By Consul J. C. McNally.]

The healthy and continuous trade development of Tsingtau, German China, in the past 14 years is further exemplified by its improvement in 1910. This development is due to many agencies, the most important being the almost perfect docking facilities and the direct transmission from ships to freight cars alongside or vice versa.

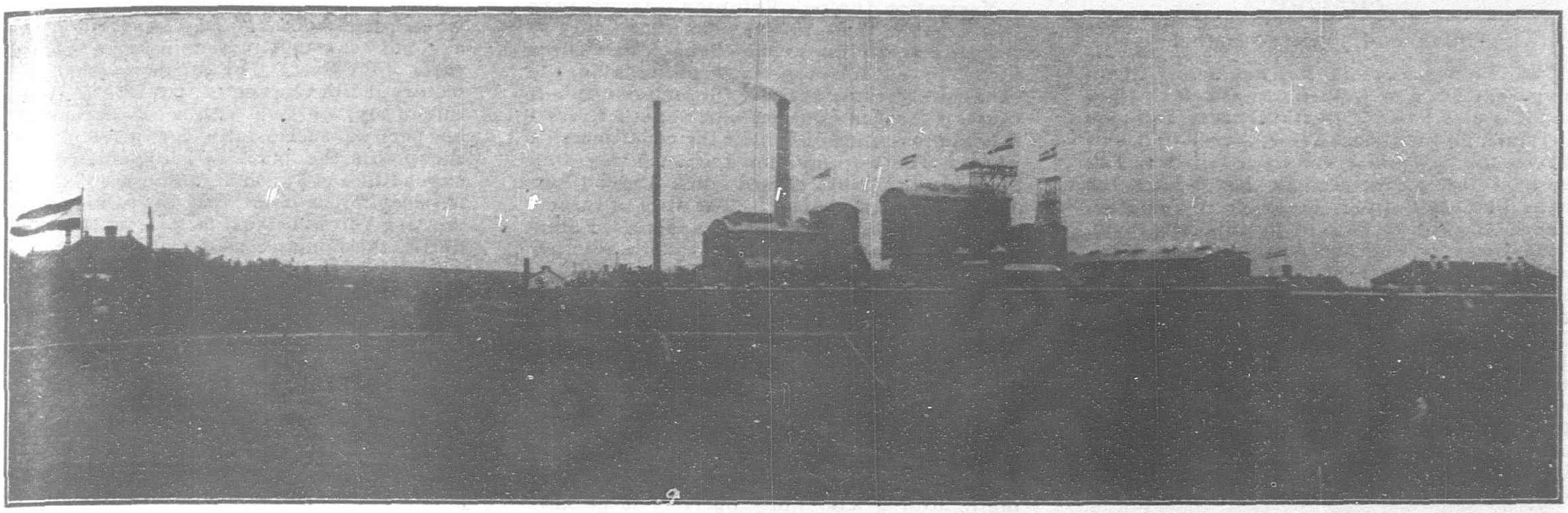
This model harbor in conjunction with the Shantung Railway has drawn trade that formerly passed through other ports, and with the railway draining the greater part of Shantung Province and the southern parts of Chihli and Honan Provinces more trade will naturally be diverted toward Tsingtau. These facilities have materially increased the output of agricultural products such as beans, groundnuts (peanuts), and straw; and of course the export of straw braid, bean, and groundnut oil, which form the bulk of the cargo of steamers direct to Europe, enjoys a corresponding increase.

Railway Construction and Traffic.—The completion of the Tsinan-Taianfu (German) section of the Tientsin-Pukow Railway will open up wide areas of trade resulting from the substantial encouragement of the Chinese authorities in Shantung with regard to agricultural development. They have already reclaimed large wastes for afforestation and for growing cotton and other plants.

The Shantung Railway during 1910 carried 760,123 tons of cargo, against 712,060 tons in 1909. The statistics of the railway showed an increase of import freight toward Tsinan from 20,516 carloads in 1909 to 24,459 in 1910, while the freight shipped toward Tsingtau was 24,954 carloads in 1909 and 26,084 in 1910. Although the value of the export trade of the port increased 65 per cent, the railway does not seem to have profited much, as most of the export goods



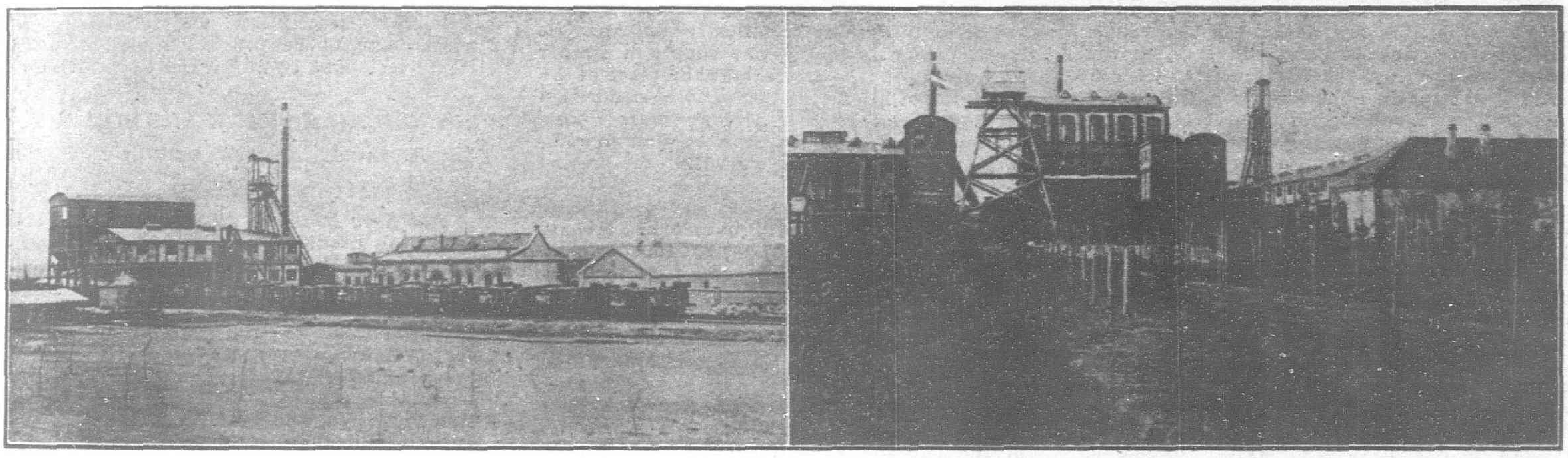
SHASI



MINES OF THE SHANTUNG MINING COMPANY

apparently arrived by other overland carriage and by junks. Passenger traffic increased from 640,190 persons in 1909 to 653,624 persons in 1910.

Shipping—Shantung Mining Co.—To comply with the increased shipping demands, the Government of Kiaochow has erected large warehouses at the dock equipped with the most modern fire apparatus, and some of them are rented to the large shipping companies. The Government has found it necessary also to extend the limitations of the harbor, and plans were formed this year to carry on the work.



SHANTUNG: SHAFTS OF THE SHANTUNG MINING COMPANY AT FANGTSE

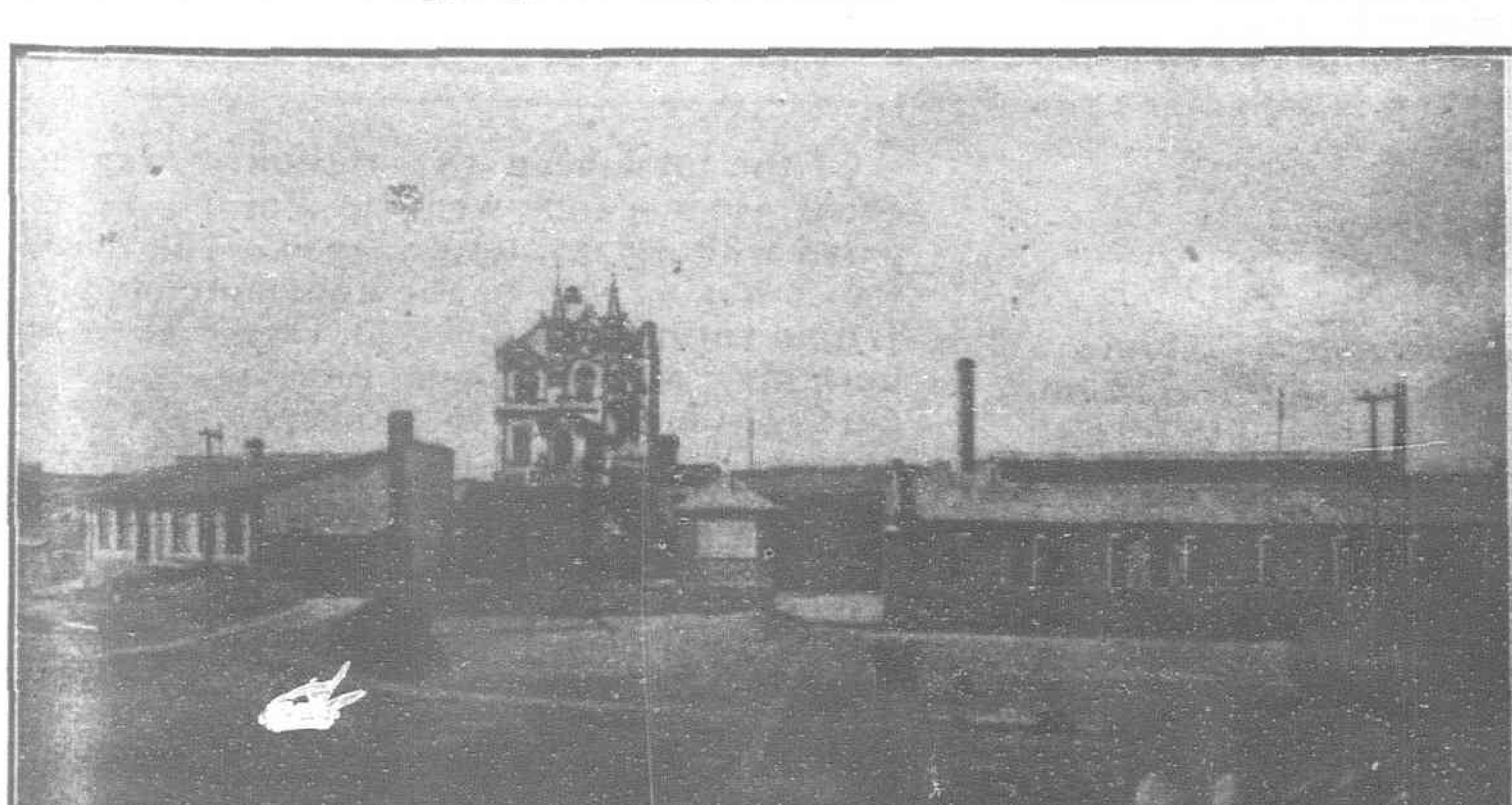
The Shantung Mining Co., a part of the Shantung Railway Co., mined at its two shafts at Fangtse and Tsetchuan, respectively, 229,342 tons and 232,043 tons of coal during 1910, a decrease of 43,000 tons compared with 1909 at the Fangtse mine, and an increase of 72,000 tons at the Tsetchuan (Hungshan) mines. The inland sales of both mines aggregated 228,000 tons. The Fangtse coal found a good market in Tsingtau for house and kitchen use, but the Tsetchuan product seems to enjoy greater popularity as a ship's coal.

In the metal imports, iron and mild steel increased, due largely to the demands of the local shipyards and the mines and railways in the interior, and to the demand for building materials for the Tientsin-Pukow Railway, the northern division of which is being built by German capital. As a consequence, the supplies were German. As the railway from Tientsin to Tsinan and its extension south toward Nanking are open the supplies can easily be carried. However, as most of the general supplies necessary for the completion of the railways now building came in 1909 there was a falling off in railway material of about $200,000. In other grades of iron and steel manufacture the 1909 level was maintained.

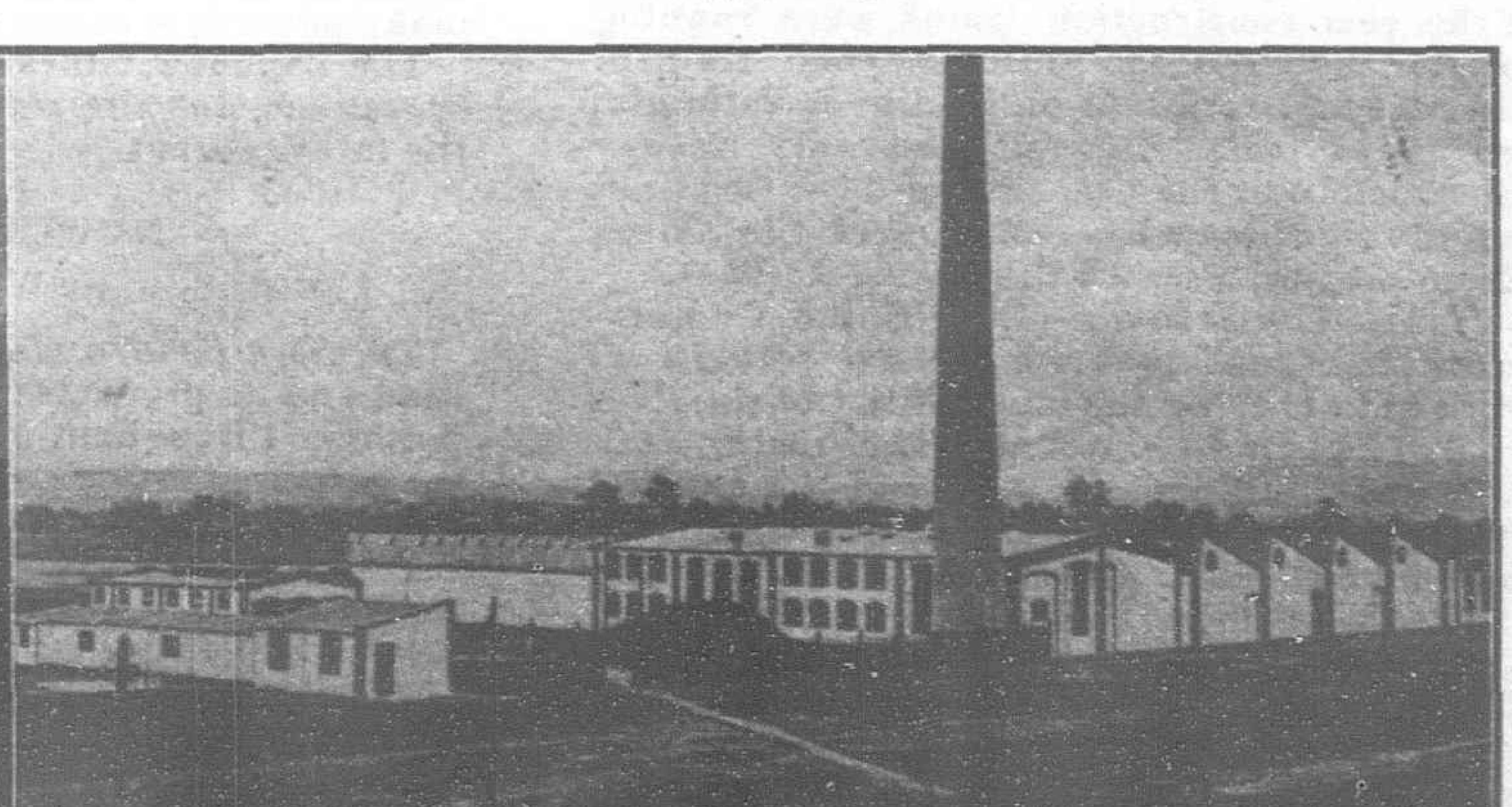
Timber and Sundries—Cotton Yarn and Piece Goods.—Timber for railway construction was sent in by American companies in 1910 to the extent of 1,127,793 cubic feet, against 24,469 in 1909. The importation of American soft woods in 1910 amounted to 8,565,601 square feet, while none was imported in 1909.

The increase in cigarettes was due mainly to the energetic advertising of one company, the good harvest which enabled the Chinese to indulge the habit and enjoy a mild substitute for opium, and the cheapness of the cigarettes enabling the poorest Chinese to buy them.

A local firm manufacturing albumen exported its commodity to Germany to the amount of 311 hundredweight in 1910, against 4 hundredweight in 1909. Dried yolks increased from 47 hundredweight in 1909 to 603 hundredweight in 1910. It is said that another Geman firm is contemplating the establishment of an egg-preserving factory.



TSINGTAU: OSTER WORKS



SILK SPINNING MILL

CHEFOO.

[BY CONSUL JOHN FOWLER.]

The Pukow-Tientsin Railway across Shantung Province was pushed forward with vigor and it is now possible to travel from Tsingtau to Tsinan on the German line, thence to Tientsin on the new line, and from Tsinan to Taianfu on the south. During last winter the mails were sent from Shanghai to Tsingtau, thence onward to Peking by this new route. The railway to Weihsien is still only a project, but the Government is beginning to see that unless the road is built the trade of Chefoo will soon be eliminated by the German port of Tsingtau and the Japanese port of Dairen (Dalny). Shipments of straw braid, once the leading item of export to the United States, have been completely shifted to Tsingtau and it is four years since an invoice for that article has been certified at this office. Another great drawback to trade is the condition of the harbor, which is exposed to heavy storms. The local chamber of commerce, after long discussion evolved a plan for the building of a breakwater, and the scheme has been submitted to the Imperial Government.

TIENTSIN.

[CONSUL GENERAL S. S. KNABENSHUE.]

Tientsin-Pukow Railway.—Work on the northern section of the Tientsin-Pukow Railway, which will connect Tientsin with Pukow, a village on the Yangtze River opposite Nanking, whence there is already rail communication with Shanghai, went steadily forward during 1910. The trouble about the location of the Tientsin terminus was settled by establishing it at the existing station of the Imperial Railways of North China, formerly called the "city" station. A new station was also established on the right bank of the river, above the native city, at the point where the old "mud wall" reached the river from the south. This station is called "Tientsin West;" the former "city" station on the Imperial Railway, now the junction with the Pukow line, is called "Tientsin Central;" while the old station in the Russian concession, formerly named "Tientsin Settlement" station, is now called "Tientsin East."

The first section of the road, which was completed, runs from the wharves of the railway at Chengtangchuang, on the Haiho, 6 miles below Tientsin, to Tsangchow, a distance of about 70 miles. The trial trip over this section took place on January 10, 1910. In April another section, from Tsangchow to Techow, 90 miles in length, was opened. On October 28 a semiweekly service was begun between Tientsin West and Tsinan, the capital of the Province of Shantung. Trains leave Tientsin at 8 a. m., reaching Tsinan at 6 p. m. Trains are also running as far as Taianfu, Shantung, 60 miles south of Tsinan.

Peking-Kalgan Line.—Trains ran regularly last year on the Peking-Kalgan line from Fengtai, just south of Peking, where this line joins the Imperial Railways of North China, to Kalgan, a distance of 102 miles. Further construction progressed slowly, and by the end of the year construction trains were running to Hanchiakupo, 40 miles beyond Kalgan. The objective terminus of this line is Tatungfu, 180 miles from Kalgan. The only railway construction of the year was on these two lines and the short spur line to connect the Ching Hsing coal mines with the Shansi Railway.

Haiho Conservancy.—The Haiho Conservancy made good progress during 1910 in its work of improving the navigability of the river from Tientsin to the sea. The main work done was the systematic raking of the channel through Taku Bar (Ferguson Channel). Soundings taken when the river opened in 1910 showed a depth at the center line of the channel of 4 feet 7 inches at the shallowest point. Raking commenced on April 6 with the new raking tugs. On July 15 there was 5 feet of water at low tide, which was the maximum record for the year. The summer freshets brought down immense quantities of silt, and the draft allowed was reduced by 6 inches; but by the middle of October the original depth was regained.

Navigation through Ferguson Channel gave less trouble than in previous years, only 26 steamers grounding in the channel, as against 63 in 1909. When a vessel grounds in the channel and remains there through one tide it causes a shoal to form, on which another vessel is liable to ground and make the condition still worse. The working down of such ridges by the raking tugs has caused much expenditure of both time and money. The draft of incoming and outgoing steamers was increased during the year, and it was seldom that a coasting steamer had to be lightered outside the bar.

The work of dredging the river opposite the city was actively continued during the year, a new and more powerful dredging and pumping plant being installed. The purchase of the land and other arrangements for the fourth cutting were completed, and with the opening of the season of 1911 the work of dredging the cutting was begun.

Mining Industries.—The Chinese Engineering & Mining Co. (Ltd.) operates large coal mines in the Kaiping basin, near Tangshan, Province of Chihli. The coal output of its mines for 1910 was 1,209,000 tons. The output is limited only by the sales, as the present plant is capable of putting out 2,000,000 tons yearly. The total shipments of the company's coal by sea was 392,000 tons, the largest market being Shanghai and neighborhood, which took 242,000 tons. The sales to railways for their own fuel were about 120,000 tons and those to steamers about the same quantity.

This company has a plant at Tangshan which manufactures fire brick, roofing, flooring and paving tiles, drainpipes, etc. This business is steadily increasing, and last year's turnover was the most profitable in the history of the works.

The company is systematically afforesting its lands, primarily to obtain a supply of timber for mining purposes, to take the place of the large importations the company is compelled to make from Japan. Already more than a million young trees are growing, and an additional million will be set out within the present year.

The Peking Syndicate (Ltd) has anthracite mines near Weihsien, Province of Honan, which produced (in 1910) 357,205 tons, as compared with an output of 244,380 tons in 1909. The greater proportion of the output was sold in the interior, but over 40,000 tons were brought to Tientsin, by boat or rail, some of which was exported to Shanghai, Manchuria, and elsewhere.

The Lincheng mines, in southern Chihli, are operated by a Belgian syndicate. The capacity of the two shafts, each 650 feet deep, is 4,000 tons for each day of 10 working hours. Unfortunately, trouble with water crippled the mines, and the output for 1910 was but 600 tons daily.

The Ching Hsing mines, on the Chihli-Shantung boundary, are worked by a German syndicate. The company has built a short railway to connect its mines with the Shansi Railway, so as to be able to extend the market for its coal. The output at present is 1,000 tons daily, but a new shaft is in preparation, which will make possible a considerable increase.

The Lanchow mines are gradually extending operations, and the company is sanguine as to the future output.

NEWCHWANG.

[FROM CONSUL WILLIAM P. KENT.]

The Soya Bean and Its Products.—The soya bean and its products continue to grow in importance throughout Manchuria and to furnish the principal articles of commercial activity at Newchwang. When it is recalled how recently the soya bean and its extensive uses have come to the knowledge of the commercial world and how rapidly it has taken its place as an article of commerce, it must be regarded as a marvel of agricultural transformation, comparable alone in modern times to the discovery of Indian corn, tobacco, and the potato. The average price for 1910 of beans, bean cake, and bean oil, laid down at Newchwang, was: Beans, $4.90 per 400 pounds; bean cake, $5.55 per 687 pounds; and bean oil, $5.75 per 133⅓ pounds.

One of the by-products of the soya bean whose manufacture is increasing is soy sauce, a condiment much used in Japan and other parts of the East. The Japanese established a factory at Newchwang in 1903 for the manufacture of soy, starting with a small capital. It has been so successfully conducted that from the profits the plant is being enlarged by an expenditure of $30,000. Some prominent Chinese capitalists from the south of China propose erecting two additional factories at Newchwang during the coming season.

The most important and profitable adjunct of the bean trade is bean milling, and during the 1909 10 season great progress was made in the substitution of modern machinery for the old type of press, in which a system of wooden wedges was used. Up to December, 1910, the number of bean mills in operation at Newchwang was as follows: Seven steam mills with an average capacity of 5,000,000 pieces of bean cake and 21,000,000 catties (catty = 1⅓ pounds) of oil per annum; 7 smaller ones with an average annual capacity of 1,800,000 pieces of cake and 7,900,000 catties of oil; and 3 others with an average annual output of 300,000 pieces of cake and 1,300,000 catties of oil. One of the steam mills employs hydraulic power on the mold presses; all the others utilize steam and oil engines simply to crush the beans preparatory to their being placed in the molds, which are worked by hand on a cog and screw system.

What is desired is a machine similar to a cottonseed press, meeting certain requirements peculiar to the bean. This suggestion implies a matter of great importance to the first devisers of a machine meeting the approval of local bean-mill owners. To accomplish this end will require a personal investigation to acquire a close knowledge of the minor details of the industry. Descriptions and details are of no avail, owing to the probable omission of some item overlooked by an inexpert investigator.

MANCHURIAN TRADE AND COMMERCE.

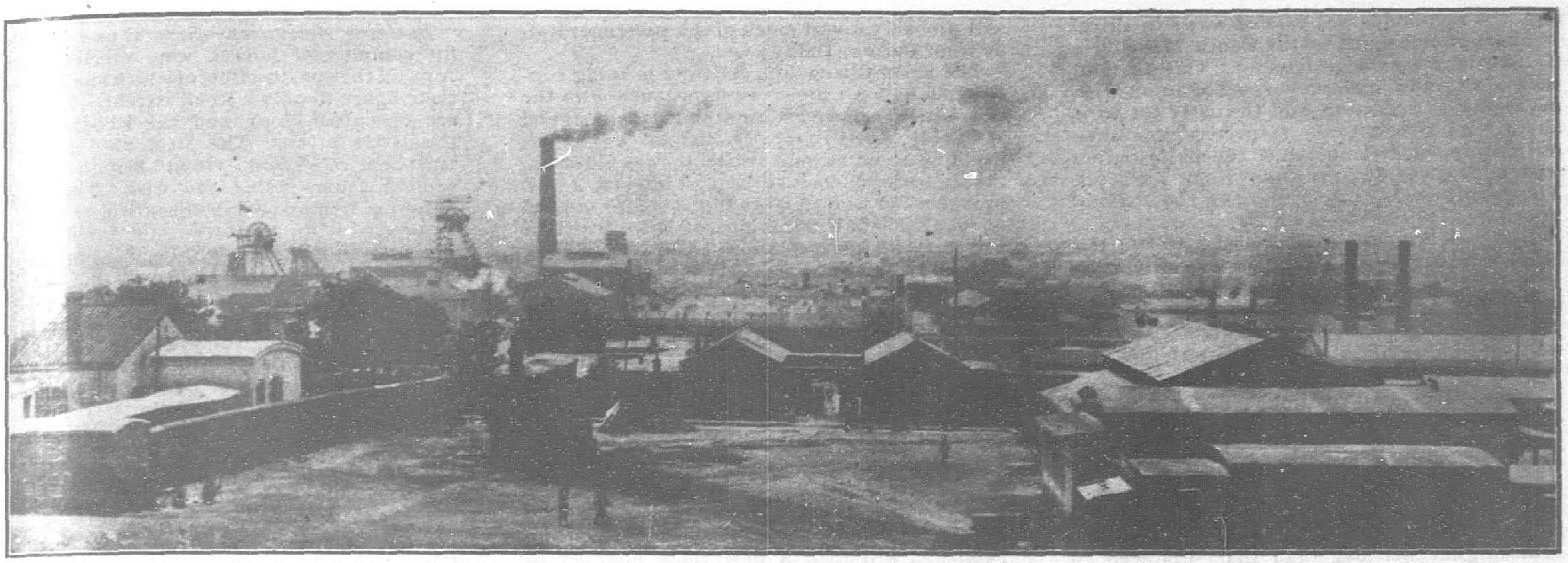
[FROM CONSUL GENERAL FRED D. FISHER, MUKDEN.]

The Soya Bean and Its Products.—As beans and bean products are the principal items of export from Manchuria, and one of the chief sources from which the majority of the Chinese agricultural population derives its ready cash, the production and the state of the market of these commodities are very important factors in the purchasing power of the people of this district. A comparison of the export of Manchurian soya beans and bean products for 1909 and 1910 through the three principal channels is as follows:

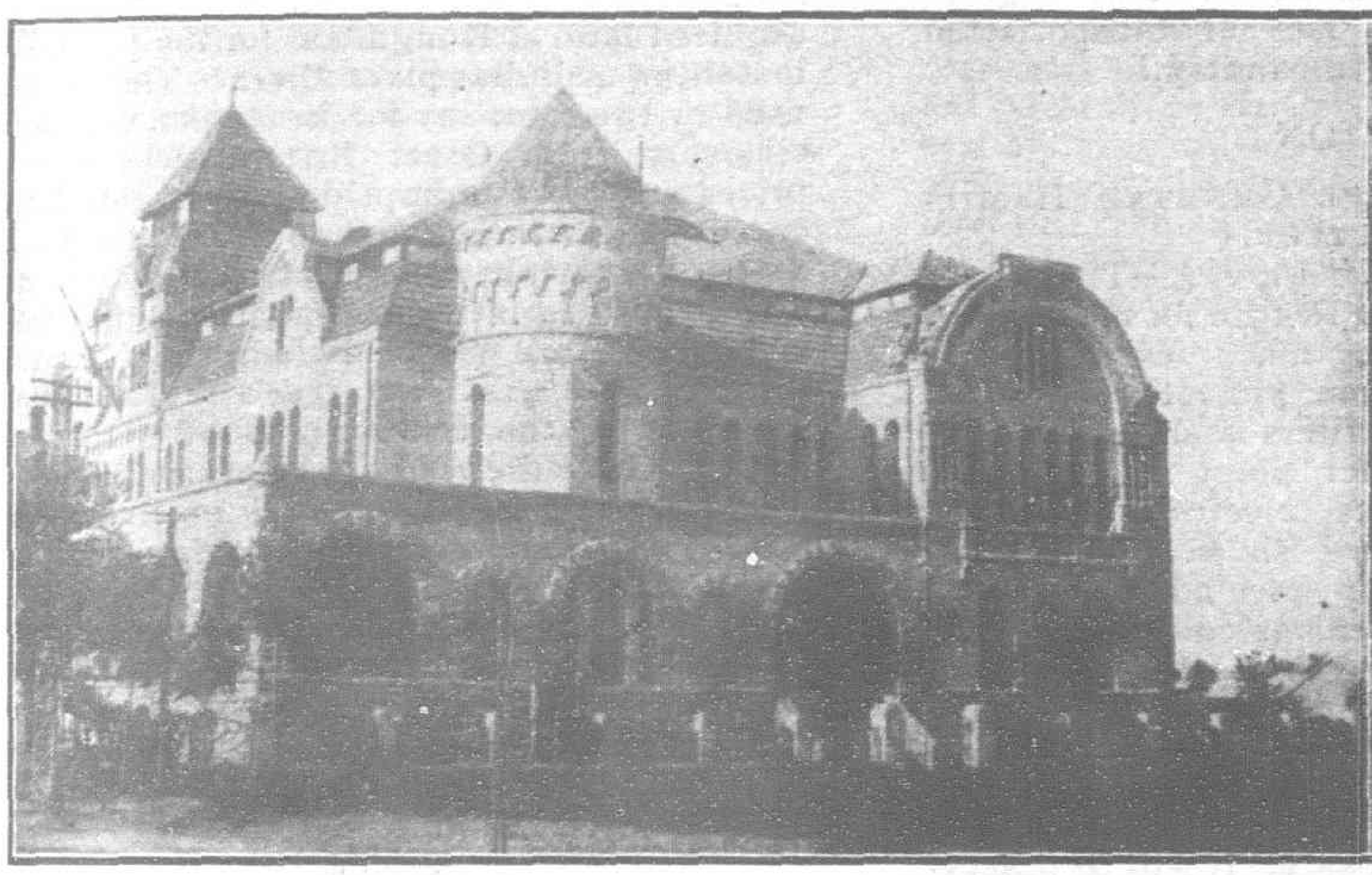
Exported through—	*Beans.*		*Bean cake.*		*Bean oil.*	
	1909	*1910*	*1909*	*1910*	*1909*	*1910*
Vladivostok tons........	256,130	382,039	13,837	11,614	394	8
Dairen (Dalny) tons........	512,466	363.664	318,825	177,447	10,850	18,700
Newchwang tons........	238,237	174,563	356,499	327,099	37,875	21,356
Total....	1,006,833	920,266	689,161	516,160	49,119	40,124

Of the total bean exportation during 1910, about 350,000 tons went to Europe, as compared with 417,000 tons in 1909. This decrease was probably due to the abundant supply of Indian cotton seed for that year. There was, however, an enormous increase in the export of bean oil to Europe. While the average price of beans per ton at Changchun during 1910 (about $14 50 United States currency) was somewhat under that of 1909 (about $15.50), the farmers, no doubt, realized handsome profits on their crops. With regard to the foreign bean buyers, however, the year was not so successful, as many lost heavily through failure to secure deliveries under contract and other causes.

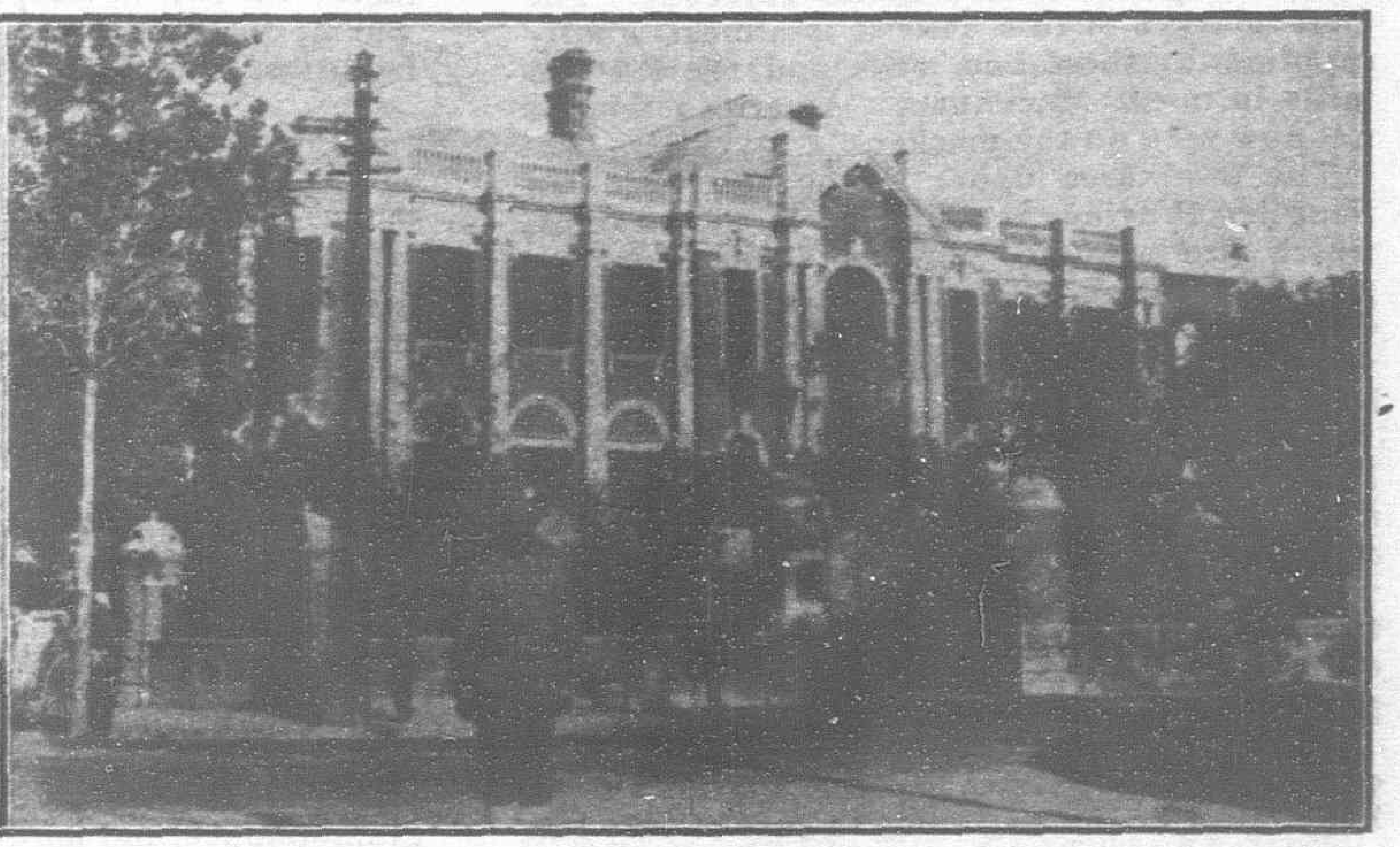
Coal.—The output of coal from the Fushun mines during 1910 amounted to 1,200,000 tons, of which about 400,000 tons were exported from Newchwang and Dalny to other ports in China,



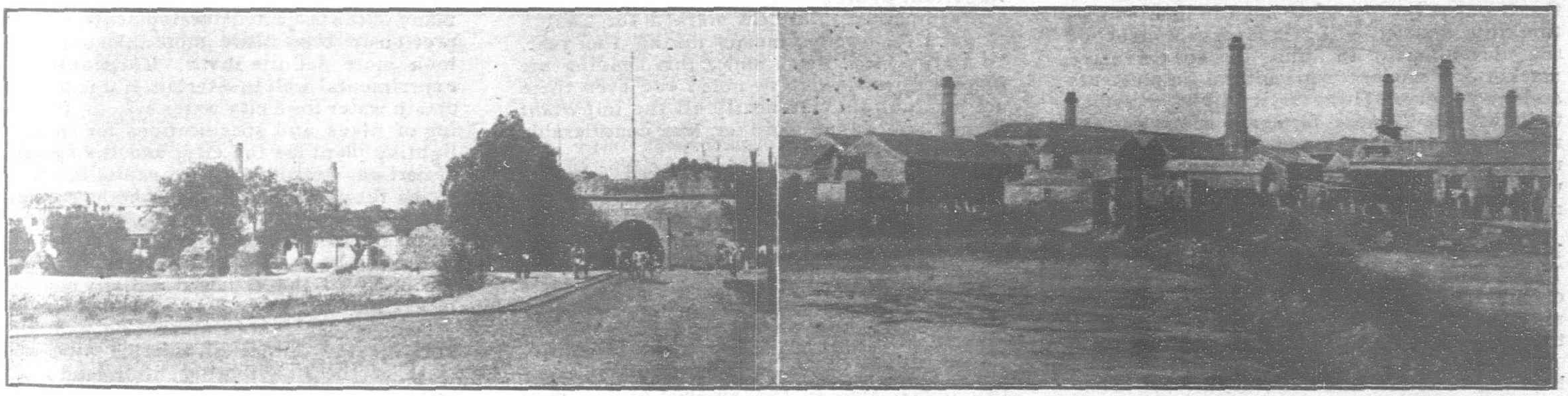
TONGSHAN COLLIERY OF THE CHINESE ENGINEERING & MINING COMPANY



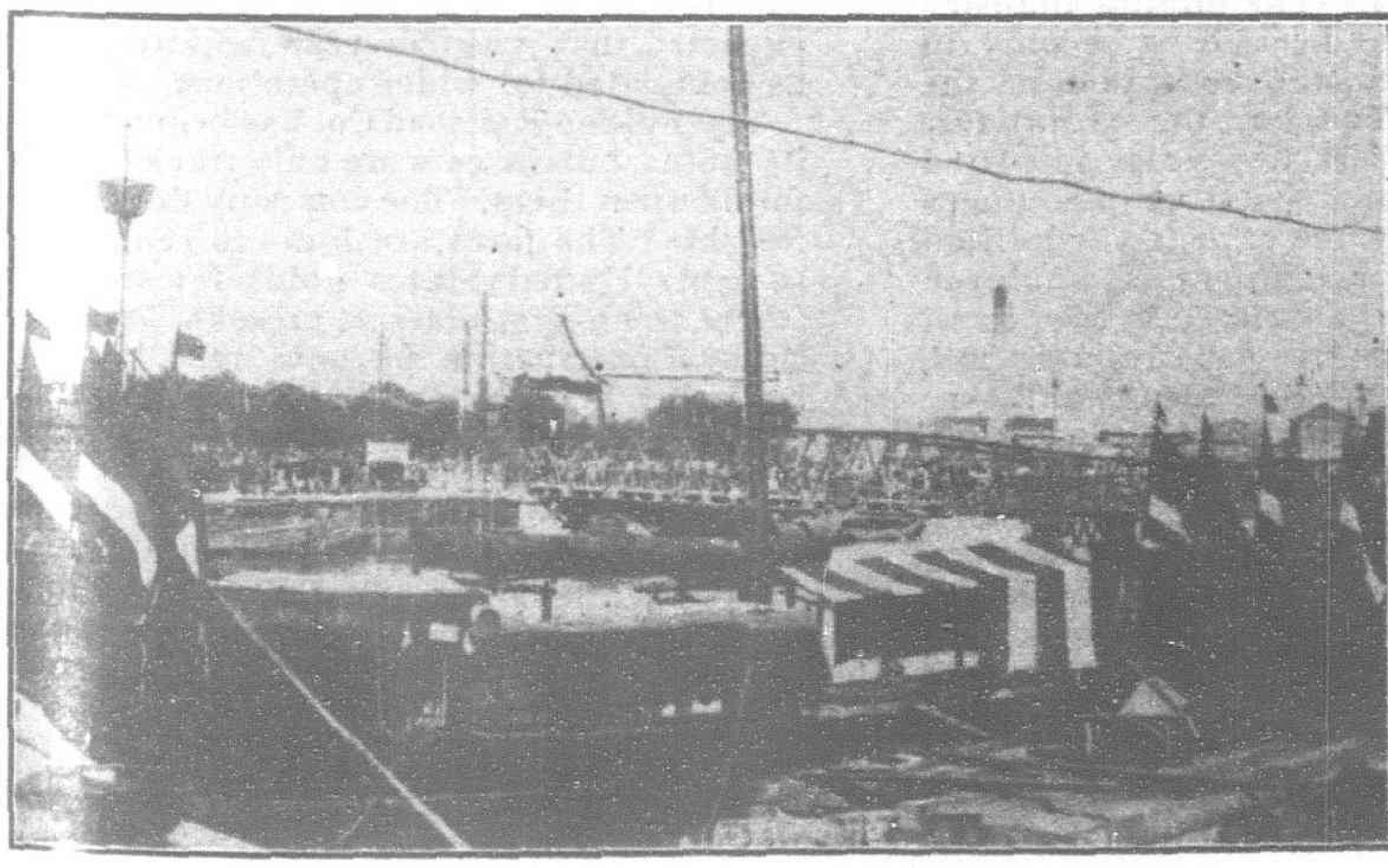
TIENTSIN: GERMAN CLUB



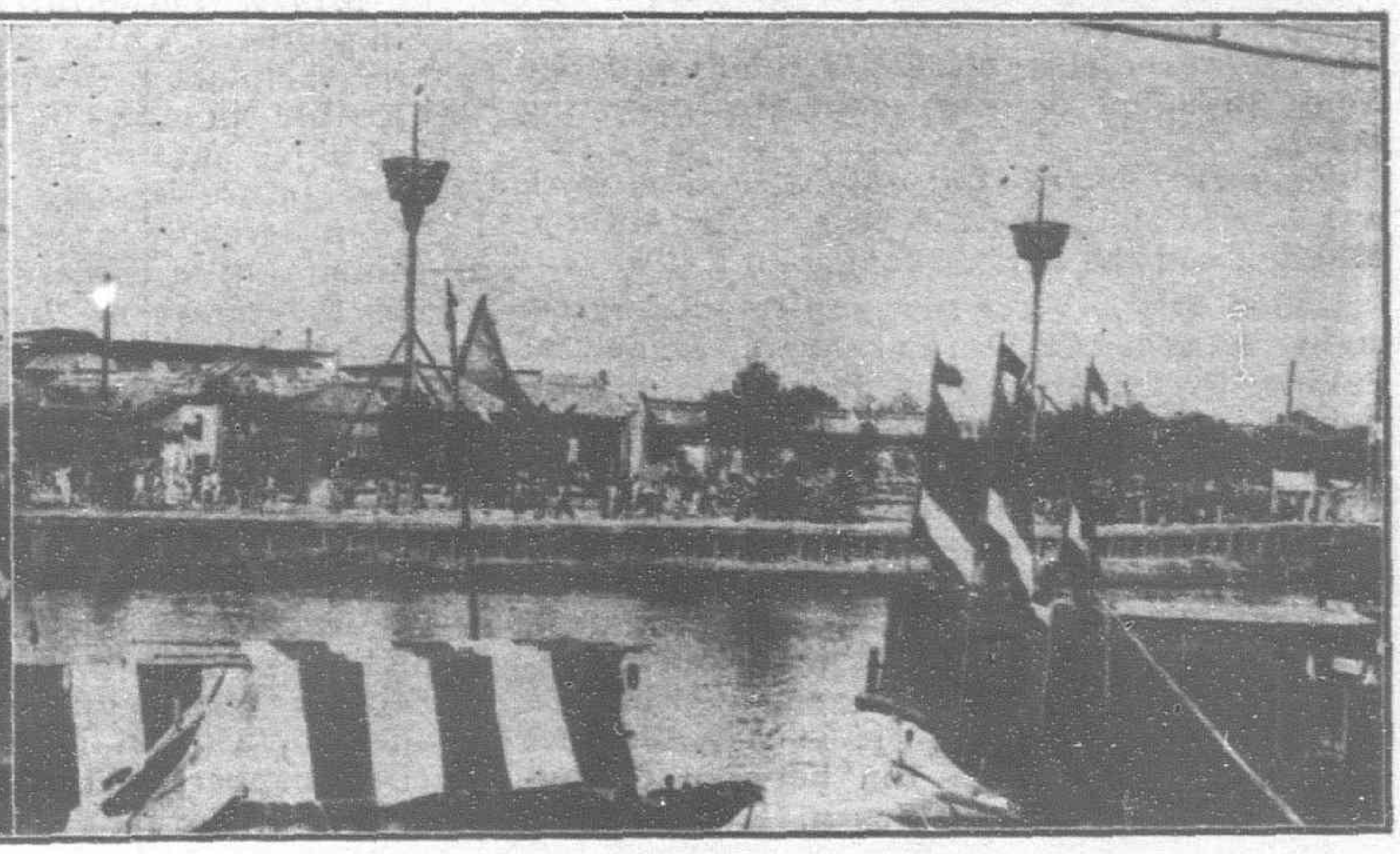
TIENTSIN CLUB



TIENTSIN: THE EAST ARSENAL



TIENTSIN: THE VICEROY'S BRIDGE



VICEROY'S YAMEN

and the remainder was carried away in ships' bunkers or consumed by the South Manchuria Railway and the local demand. One shaft in each of the new pits known as Togo and Oyama is now in operation, and the daily output is about 500 to 600 tons, respectively. When fully equipped and operated, the daily output will approximate 3,000 tons from each pit. The output during 1910 of the Pen Hsi Hu coal mines was 120,000 tons, which was disposed of locally. While the coal deposits at Pen Hsi Hu are reported to be not very extensive, the mines will in time probably be an important factor in the exploitation of the iron-ore deposits near Chinkeng, some 18 miles distant. These ores are said to contain 70 per cent of iron of a fine quality.

Flour.—There are two flour mills in the Mukden consular district—one in Tiehling, owned by Japanese, and the other in Kwanchengtzu, owned by a British firm. These mills are equipped with modern machinery and during a working day of 10 hours each has an output of 200 barrels. The price of Tiehling flour is 5 cents higher per bag than that produced in Kwanchengtzu. During the past year the price per bag of 50 pounds obtained for Tiehling flour was $1.04 United States currency. The flour market of this district is almost wholly supplied by these two mills and the Russian mills in north Manchuria. American flour is not now seen on the market.

The total area under cotton cultivation in Fengtien Province is estimated at 11,500 acres, which are said to produce about 4,000,000 pounds of cotton. Manchurian cotton is reported to be of better staple than that grown elsewhere in China. This production is consumed locally.

Machinery, Stoves, and Condensed Milk.—During the past few years considerable advancement has been made in the introduction of electric-lighting plants in Manchuria, and it is probable that this field offers a fair future in this line, as there are a number of towns and cities where such plants could be advantageously installed.

Up to the present time the low scale of living of the Chinese farmer and the limited size of his holdings have warranted the use of only the simplest agricultural implements. If the agricultural resources of Manchuria are developed in accordance with schemes which the Chinese Government is reported to have in contemplation, this district will be a favorable field for the development in time of an extensive market for modern agricultural implements and machinery. However, it will be necessary to induce the Chinese farmer to adopt western methods of agriculture and educate him in the use of modern implements and machinery—an undertaking of magnitude that will require much perseverance and patience.

During recent years a moderate demand for heating stoves has grown up in Manchuria. This, however, is being supplied, so far as the cheaper grades of stoves are concerned, by the native-made article, but in the higher grades there has been some call for American stoves.

Galvanized iron, cement, nails, and other building materials find a limited market in the larger cities along the railway, where construction under European methods is followed, and there is a growing demand for graphophones, bicycles, photographic materials, etc. In these lines, however, this market is chiefly supplied from Shanghai or other general distributing points.

Railway Construction.—Construction work was carried on during the year on the Antung-Mukden and the Kirin-Changchun Railways.

Under Article VI of the supplemental agreement between China and Japan, signed at Peking, December 22, 1905, Japan obtained the right to improve the then existing narrow-gauge military railway line between Antung and Mukden, and is now engaged, in the name of the South Manchuria Railway, in carrying out this work by constructing a new roadbed in many places and standardizing its gauge. The line was to be completed and open to traffic about November 3, 1911, and will have a total length of 186 miles. It is reported that express trains will then run between Changchun, Manchuria, and Fusan, Korea. This will probably divert much of the passenger traffic from Dairen (Dalny).

The Kirin-Changchun Railway is being constructed by the Chinese in accordance with the convention between China and Japan, signed at Peking, April 15, 1907. Its total length will be about 80 miles, and while it was intended that it be completed by the end of 1911, it will probably not be opened to traffic before the end of 1912. Kirin is the capital of Kirin Province and one of the largest cities in Manchuria, having a population estimated at 100,000. The completion of this line will open a new channel of distribution for goods destined to points in north Manchuria, which will then be handled by rail to Kirin and thence sent by river craft down the Sungari River.

Under Article VI of the Manchurian agreement between China and Japan, signed at Peking, September 4, 1909, China is to undertake the extension of the Kirin-Changchun Railway eastwardly to the southern border of Yenchi Prefecture to connect at Hoiryeng, on the Korean border, with the Korean Railway. This extension will open a new trade channel by rail from the Korean seaport of Seishin to the Yenchi district, and will be a very important factor in the development of that region, which, on account of a lack of transportation facilities, is now a virgin country.

CANTON.

[FROM DEPUTY CONSUL GENERAL HAMILTON BUTLER.]

Machinery and Metal Market.—There was little demand at Canton in 1910 for machinery, etc. Sewing and knitting machines and parts advanced, however, from $10,261 in 1909 to $24,971 in 1910; typewriters and parts, from $2,003 to $2,483. Water plant and fittings, gramophones and parts, electrical materials, hardware, and cutlery showed substantial gains. Lamps and lamp ware advanced from $9,897 to $10,328; but enameled ware fell off slightly. It is gratifying to observe that in the majority of cases the increases mentioned above are in goods which come to Canton largely from the United States, especially in sewing and knitting machines, typewriters, gramophones, and hardware. It will be observed, however, that in none of these items has the amount imported at Canton reached an important figure.

A sympathetic dullness marked the Canton demand for foreign metals during the year. In only a few items under this heading are increases over 1909 to be noted and even these are insignificant. In nearly all the important items there was a more or less considerable falling off.

Tin plates, undecorated, advanced from 4,036,800 pounds to 5,892,533 pounds, and less important increases are noted in lead pigs and bars, galvanized-iron wire, iron and steel sheets and plates, nail rods, brass and yellow metal sheets and plates, and antimony. The dullness which characterized the metal and machinery market during 1910 was due largely to the low exchange value of silver, which seriously affects imports in general and especially these two items, and to the absence of any considerable new building construction inaugurated at Canton during the year.

Mining Possibilities.—The mining industry in southern China may be said to be only in its incipiency. With the exception of the Kochiu tin mines in Yunnan, the proprietors of which have in the last few years imported foreign ore-dressing and smelting machinery from Germany to the value of nearly a million dollars, little modern machinery is employed in the mines of this district. A few small orders have been placed in Japan and the machines sent into Kwangsi, and an insignificant and unsuccessful attempt has been made to bring antimony mining and smelting up to date.

Although the richest district in China in mineral deposits, the Canton consular district, including the Provinces of Yunnan, Kweichow, and Kwangsi and the major portion of Kwangtung, is perhaps the most backward of all the districts of the Empire in the proper development of its mines. In the fine tin, iron, copper, gold, and silver deposits of the district there are great potentialities.

Building Activities.—Several new buildings for commercial houses were erected during 1910, in the construction of which steel and concrete figure to only a small extent. The walls are of native brick and the woodwork from the native forests. The steel used comes almost entirely from Great Britain and the cement from native factories. The limited building area on the Shameen is now practically covered with structures, and building construction from now on will be found principally when old houses are replaced by new—a process not much in vogue at Canton.

In the native city some modern buildings were erected during the year, and it is probable that as time goes on most if not all of the Government bureaus will be housed in premises as pretentious as the new Admiralty Building. The Commissioner of Foreign Affairs is already contemplating the erection of a fine new foreign-style home for his department, and his example will be followed by many of his colleagues. Certain features of foreign-building construction and architecture are now much in favor with many of the more progressive members of the mercantile class.

The Standard Oil Co. erected an oil tank, accessory warehouses, etc., at Wuchow and acquired land at Kongmoon for the purpose of installing a similar plant there. The material used by the company for its tanks comes exclusively from Great Britain, where lower prices and more prompt deliveries can be secured, it is claimed, than from the United States. A certain amount of bunding was done during the year at various points in the district and much more will be done in the future. A bridge across the front reach of the Canton River, from the Southern Bund to Honam Island, where the river is something over 1,000 feet wide, with its piers resting on Dutch Folly Rocks, was sanctioned as far back as 1906 and is still talked about. No definite steps have been taken, however, to effect its construction. The leveling of the city walls and the creation of wide, well-paved boulevards on their site is still being mooted, but nothing has yet been done in the matter.

AMOY.

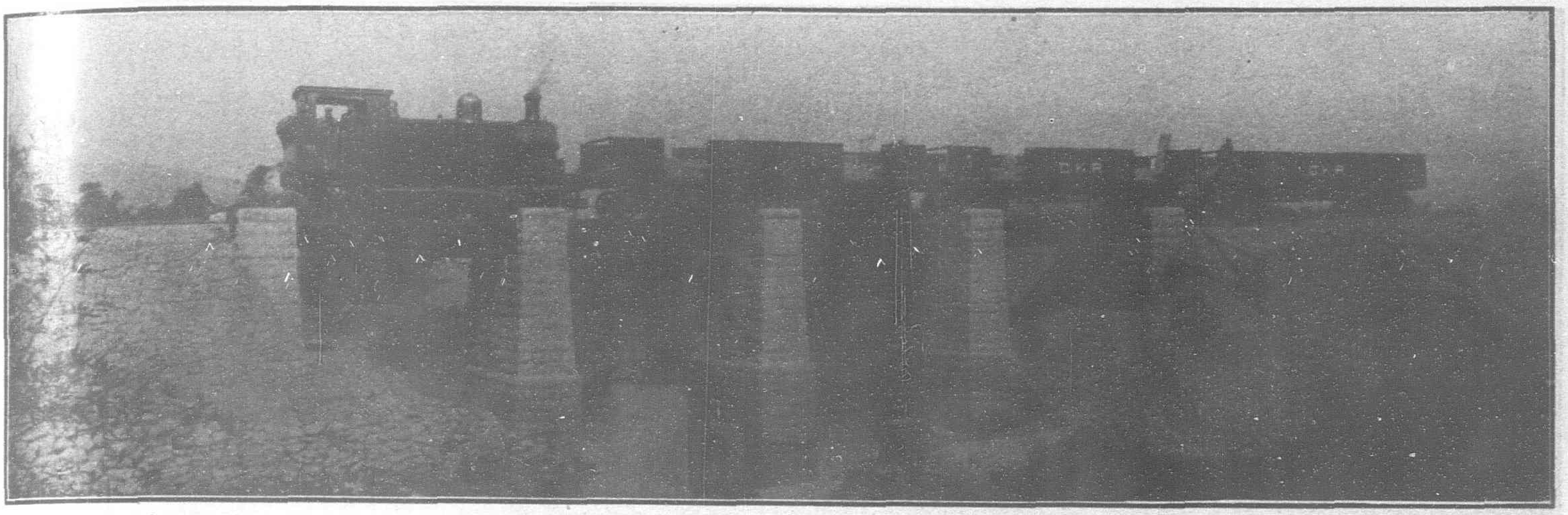
Waterworks and Lighting Plant—Mining and Cotton—Fukien Railroad.—During 1910 many of the projected developments, which had previously been little more than suggestions, took more definite shape. The sinking of an experimental well to ascertain if it is possible to obtain water for a city water system, the drawing of plans and specifications for an electric lighting plant for the city, and the agreement of certain wealthy Chinese capitalists to subscribe the money necessary for the enterprise, and the erection of two small sugar mills to attempt the grinding of sugar on a modern basis as learned by the recent experiences in Formosa, point to the renewed activity among the local Chinese.

Two companies are endeavoring to find markets for the output of the rich mines said to exist in the neighboring hinterland and are arranging for adequate surveys for the preliminary operations. During 1910 the first crop of cotton grown from American seed was taken. The results are reported as excellent and it is expected that within a year definite plans will be completed for wider operations.

The Fukien Railroad Co. has begun to operate its trains, but the cars are only trucks with platforms upon them. The company does not carry freight. The fares are low—20 cents Mexican (9 cents United States gold) for second class (there is no first class at present) for a 10-mile ride. Construction of new road has ceased, but when the contemplated reorganization of the company has been completed it is expected that the work will be resumed.

Machinery imports have increased rapidly, reaching about $40,000 in the past year. With the further development of the railway and the new enterprises now contemplated, it is expected that this item will continue to show substantial gains.

Oil Imports Smaller.—American kerosene shows a decline of over $68,000 and Sumatra oil of over $44,000, while Borneo oil imports



TRAIN ON THE BRITISH SECTION OF THE CANTON-KOWLOON RAILWAY

increased $22,631. This is partly explained by the fact that at the close of 1910 the stock of American kerosene was very low, large importations of oil being made soon after the beginning of 1911. These, if added to the actual amount imported during 1910, would explain some of the difference. However, the peculiar conditions existing in the oil trade during the year is accountable for some of the unfavorable showing.

The heavy decline in the importations of railroad materials is explained by the fact that the railroad company practically ceased construction during the early part of 1910, owing to lack of funds.

Opportunities for Manila Merchants.—As there are two regular lines of steamers between Amoy and the Philippine Islands and as approximately 75 per cent of the Chinese in the Philippines come from this district, it would appear that the merchants in Manila might do well to actively cultivate business opportunities near this port. The great amount of inland traffic shows the importance of Amoy as the distributing center for south Fukien. Philippine hardwoods would seem to offer an especially good opportunity, owing to the scarcity of such wood in this vicinity.

COMMERCE AND INDUSTRIES OF SWATOW.

[BY CONSUL CHARLES L. L. WILLIAMS.]

Swatow-Chaochowfu Railway—Waterworks Construction.—The Swatow-Chaochowfu Railway reported a satisfactory year, having carried 800,000 passengers and 25,000 tons of freight. Unfortunately, the roadbed, rails, and rolling stock are all inferior, and if it is ever linked up with any of the trunk lines now under construction, it will have to be entirely rebuilt. A step toward this linking up is being discussed—a line from Chaochowfu, the present railhead, to Hweichowfu, 125 miles southeast of Chaochowfu, and some 60 miles northeast of Kowloon, the terminus of the Canton-Kowloon line. This project has received the hearty support of the Provincial authorities and assembly, and it is quite possible that some definite step may be taken soon. Material must, of course, be purchased abroad.

A light "trolley" line—small cars pushed by coolies—is to be built from Chenghai, the magisterial city of this district, population 40,000, to Ampo, a city on the Swatow-Chaochowfu Railway with a population of 50,000. The principal object of this line will be to serve as a feeder to the railway, but there may also be considerable local traffic. The estimated cost is $43,800, which has been raised locally. No bridges will be built, the Han River being crossed by ferry. A proposal to build an electric line from this port to Tinghai has been abandoned.

Considerable progress was made with the waterworks during the year. The intake station is at Ampo, on the Han River. The water will be brought to Swatow through a 12-inch main gravity feed pipe line, the drop from Ampo to Swatow being about 10 feet. The contract for installing machinery, tanks, towers, pipe lines, etc., was awarded to a Hongkong firm. The waterworks and the local electric lighting plant are controlled by private Chinese capital.

FOOCHOW'S FOREIGN TRADE.

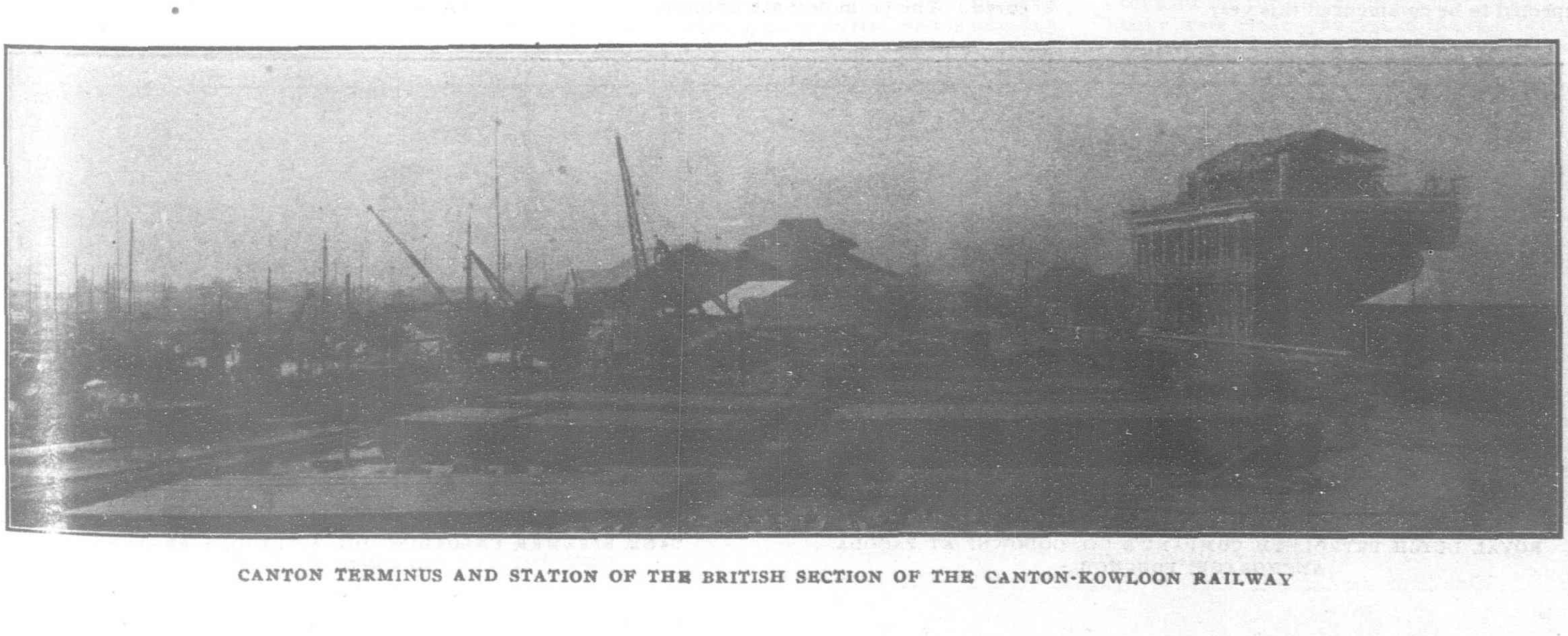
[BY CONSUL SAMUEL L. GRACEY.]

Canned-Good Factory—Nanking Exposition—Fruits.—In 1910 Foochow's first canned-goods factory was established. It is called the "Mai Lo Co.," and puts up a great many varieties of canned fruits, fish, and other local products.

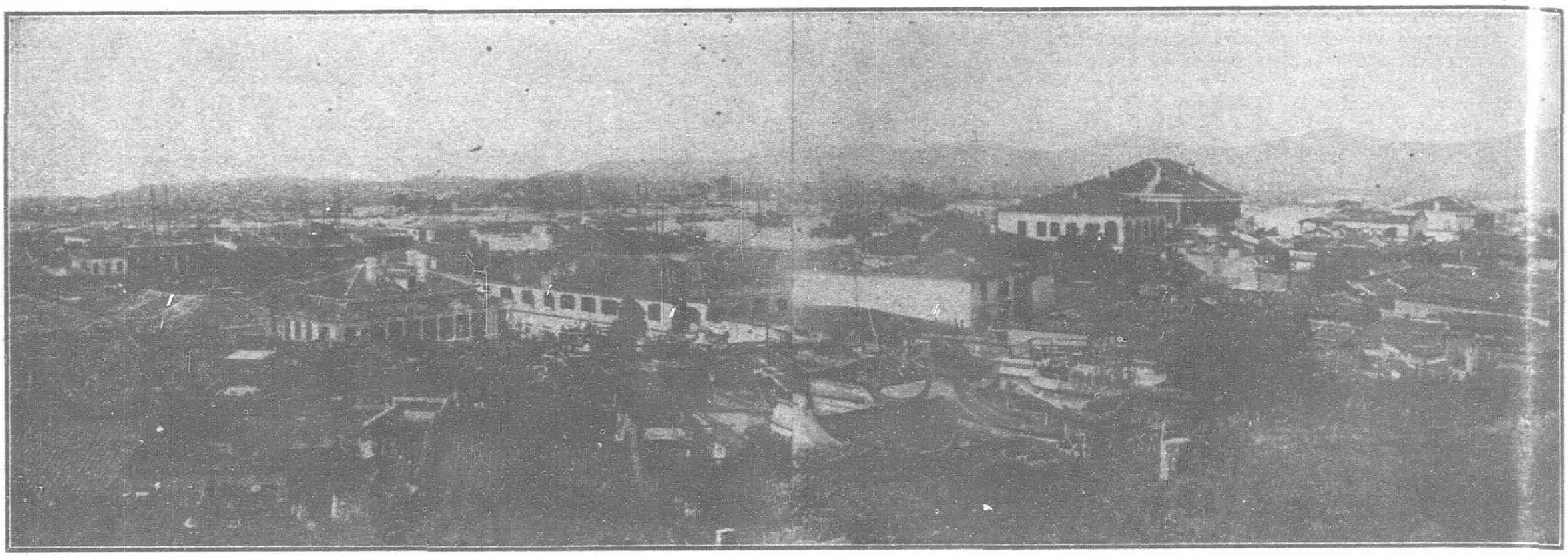
The merchants of Foochow participated in the National Exposition held at Nanking in 1910, and the exhibit gave great satisfaction. Since the exposition closed the people, realizing the benefit derived from it, are cooperating with the provincial and local officials in founding a commercial museum for local exhibition of Fukien products at Foochow.

During 1910 the native fruit exporters had an exceptionally lucrative trade. Olives and oranges, the main fruit exports, were sold at high prices in the northern Provinces. Owing to the extension of the railway lines and other facilities in transportation, which have recently been introduced in the northern Provinces, oranges have a much larger field of sale, as they can now be carried to a greater distance before spoiling. The consumption of 1910 in the northern markets was over 8,000,000 pounds, as against 4,000,000 pounds in 1909, and of olives, 4,283,066 pounds, against 2,880,300 pounds in 1909.

Electric Lighting Company—Camphor Production.—A new electric lighting company was organized in 1910 by some influential Chinese. Two thousand four hundred shares of stock at $50 (Mexican) per share were issued. As the two old companies which had obtained permission to install works had both been found unsatisfactory, an official license was granted the new company on August 25, 1910, by the viceroy of Minche, to put up a much larger plant for lighting the whole city and suburbs. The Shanghai agents of the General



CANTON TERMINUS AND STATION OF THE BRITISH SECTION OF THE CANTON-KOWLOON RAILWAY



GENERAL VIEW OF FOOCHOW

Electric Co., of America, tried to obtain from the native company the order for machinery and other goods, and sent an American engineer here to push the sale, but a Japanese firm gave much lower quotations and more favorable terms for what it claimed to be the same brand of goods, and consequently obtained the order.

The manufacture of prepared camphor has fallen off greatly, dropping from 524,800 pounds in 1909 to 130,800 pounds in 1910. The largest factory, which was conducted by a British firm, has gone out of the business, and there is at this time only one important factory left. Crude camphor is scarce, and the up-country forests do not promise any increase in supply.

WUHU.

[By Consul W. T. Gracey, Nanking.]

Foreign Settlement—Anhwei Railway.—The development of the foreign settlement is still retarded by the difficulties incident to the removal of the customs establishment to a more central and suitable position. A site was selected many years ago, adjoining the property of the Anhwei Railway Co., but this is occupied by timber yards, and the wood merchants seem determined to retain the land. No development of the port can take place until all timber yards and rafts are entirely removed from within the harbor limits, but the raft guilds are strong and no successful negotiations have been carried through, though suitable properties have been offered them.

Practically no progress has been made in connection with the Anhwei Railway from Wuhu to Kwangchow. A certain amount of filling in has been done on the site of the future station yard, but the work is a long way from being finished. The building of the river wall was expected to be commenced this year.

CHINKIANG.

The Chinkiang paper mill remains as it was at the end of 1909. This mill proved a failure, owing, among other causes, to the failure of the Hsin Yi bank in 1909, of which one of the mill directors was the proprietor. Litigation ensued in the mixed court in Shanghai, and the net result of the whole affair is that the expensive plant, only a portion of which had been installed, is still lying idle and neglected, and there are apparently no funds to meet outstanding liabilities.

The flour mills under construction by American interests at Suchien and Haichow were damaged in the spring of 1910. The Suchien glass works met with misfortune and from motives of economy had to dispense with the services of the manager and his workmen, all of whom were Austrians. The manager has been making some inquiries about the price of land at Chinkiang, and there seems to be a possibility that an Austrian glass works may be started on a small scale.

Projected Railways—Shanghai-Nanking Railway.—A survey was made during August and October, 1910, for a railway, projected to run between Suchien and Hsuchowfu, being a portion of the proposed Haichow-Tsingkiangpu-Hsuchowfu line. Another survey has been made of a proposed line from Taichow to Shiherhwei, via Yangchow and Kuachow, an approximate distance of 48 miles. The gauge is to be standard, 4 feet 8½ inches, and the freight carried will be principally salt, but a large passenger traffic should also result. The bridge work necessitated will be heavy, the earthwork light. If built, the line is to be an up-to-date one. The necessary authorization has been obtained from the authorities at Peking, but it is not yet certain where the money will be secured. The promoters are Chinese.

There having been no change in the likin arrangements since last year, freight traffic by the Shanghai-Nanking Railway is still said to be hampered considerably. The passenger traffic was larger than in 1909, due partially to the exposition held at Nanking. The opening of the Tientsin-Pukow Railway is expected to increase this traffic still further, but it is not expected that it will have any great effect on the goods traffic unless other arrangements are made with the likin offices. Single driving-wheel engines, of a heavy type, have been put on the new express trains, bringing the time for the entire journey from Shanghai to Nanking down to 5 hours 55 minutes, against 6 hours 52 minutes on the old schedule.

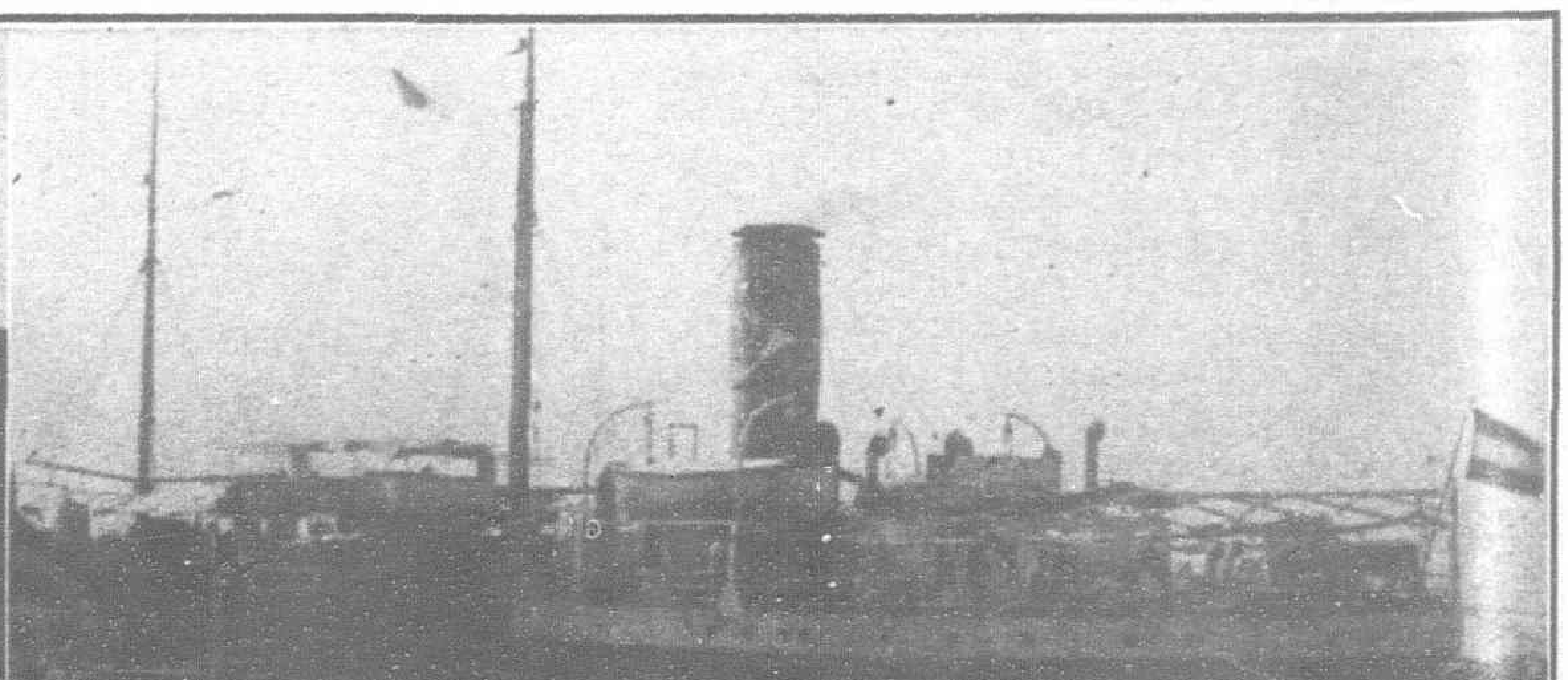
CHUNGKING.

[By Consul Albert W. Pontius]

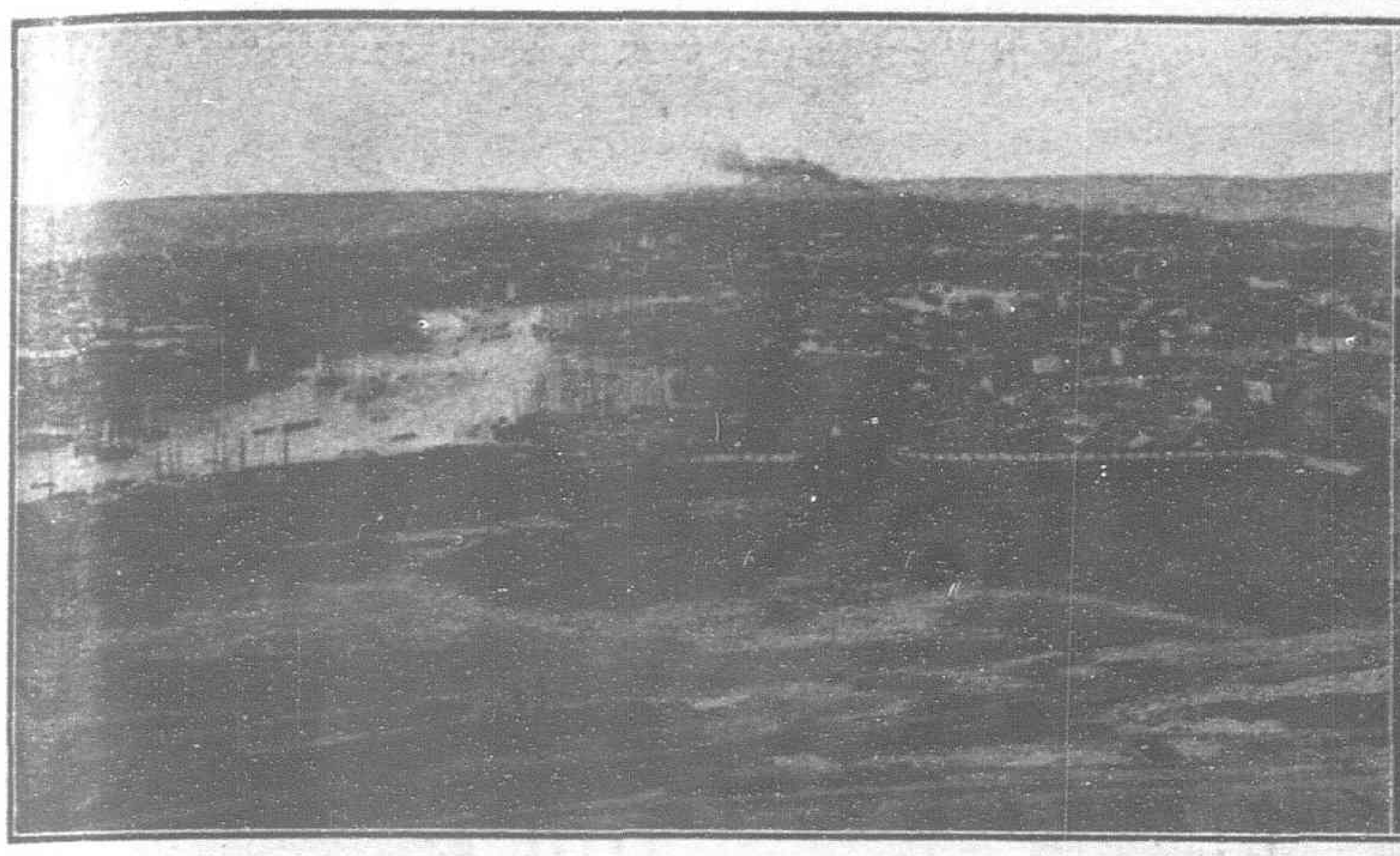
The Year's Shipping—Harvests Good—Railway Construction.—The Chinese steamer *Shutung* made 14 round trips from Ichang in 1910 and netted the company a clear profit of about $50,000 for the year. The number of junks which entered and cleared Chungking in 1910 was 2,056, slightly less than the previous year.

Railway construction on the Ichang-Wanhsien line made fair progress. In December 10 sections were under construction, each of 30 li (about 10 miles). At a meeting of the railway company at Chengtu in early December, it was decided to construct a line from Chungking to Chengtu, and give it preference in construction because of the limited capital on hand and the eavy cost of building the Ichang-Wanhsienh ection. It was also decided to appropriates 1,000,000 taels ($640,000) for the purchase of the Shutung Steamship Co. and the construction of vessels of the *Shutung* type, in order to establish a railway-steamer service between Ichang and Chungking. During 1910 two

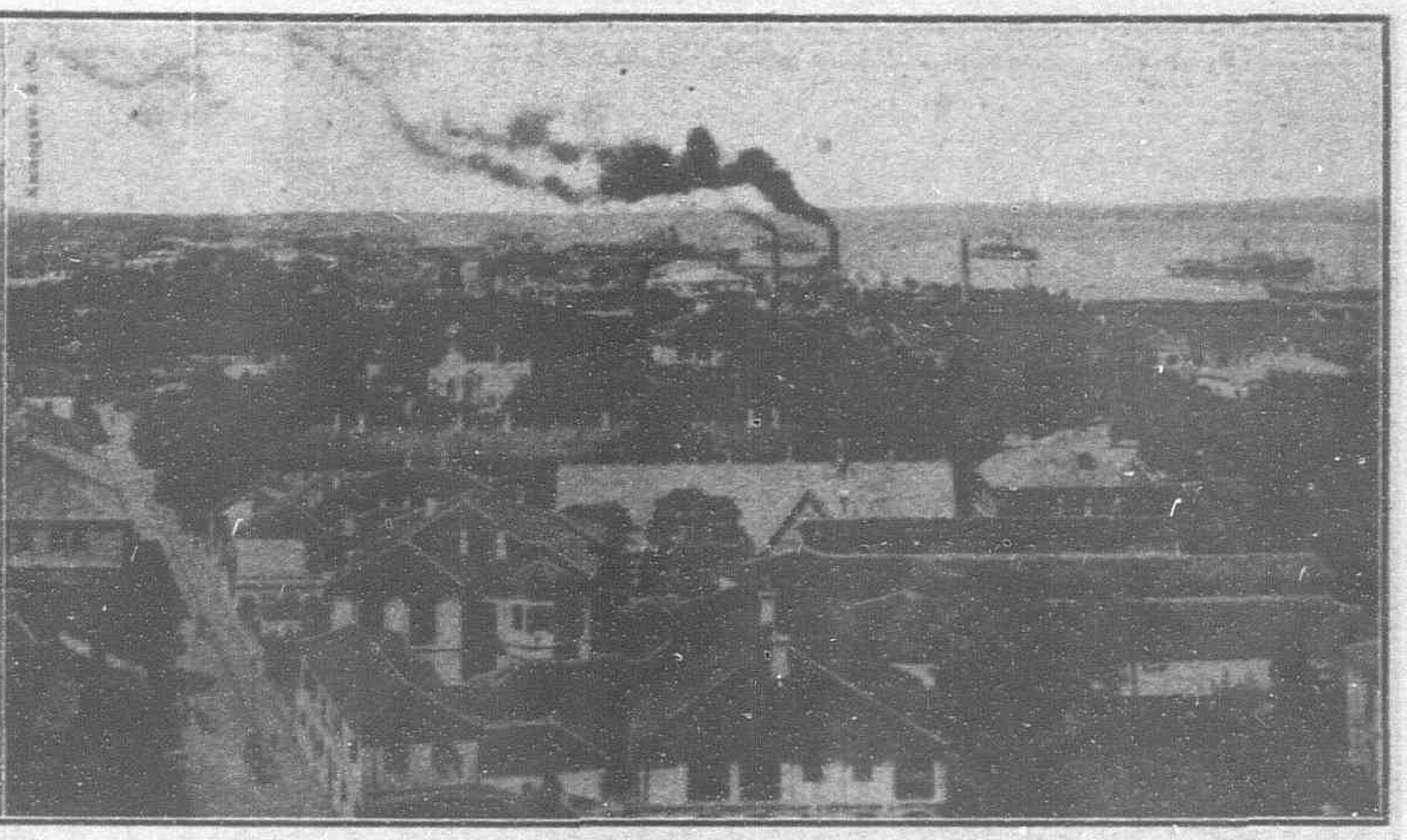
ROYAL DUTCH PETROLEUM COMPANY'S OIL GODOWNS AT PAGODA ANCHORAGE, FOOCHOW



TANK STEAMER UNLOADING OIL AT PAGODA ANCHORAGE, FOOCHOW



HANKOW: HAN RIVER



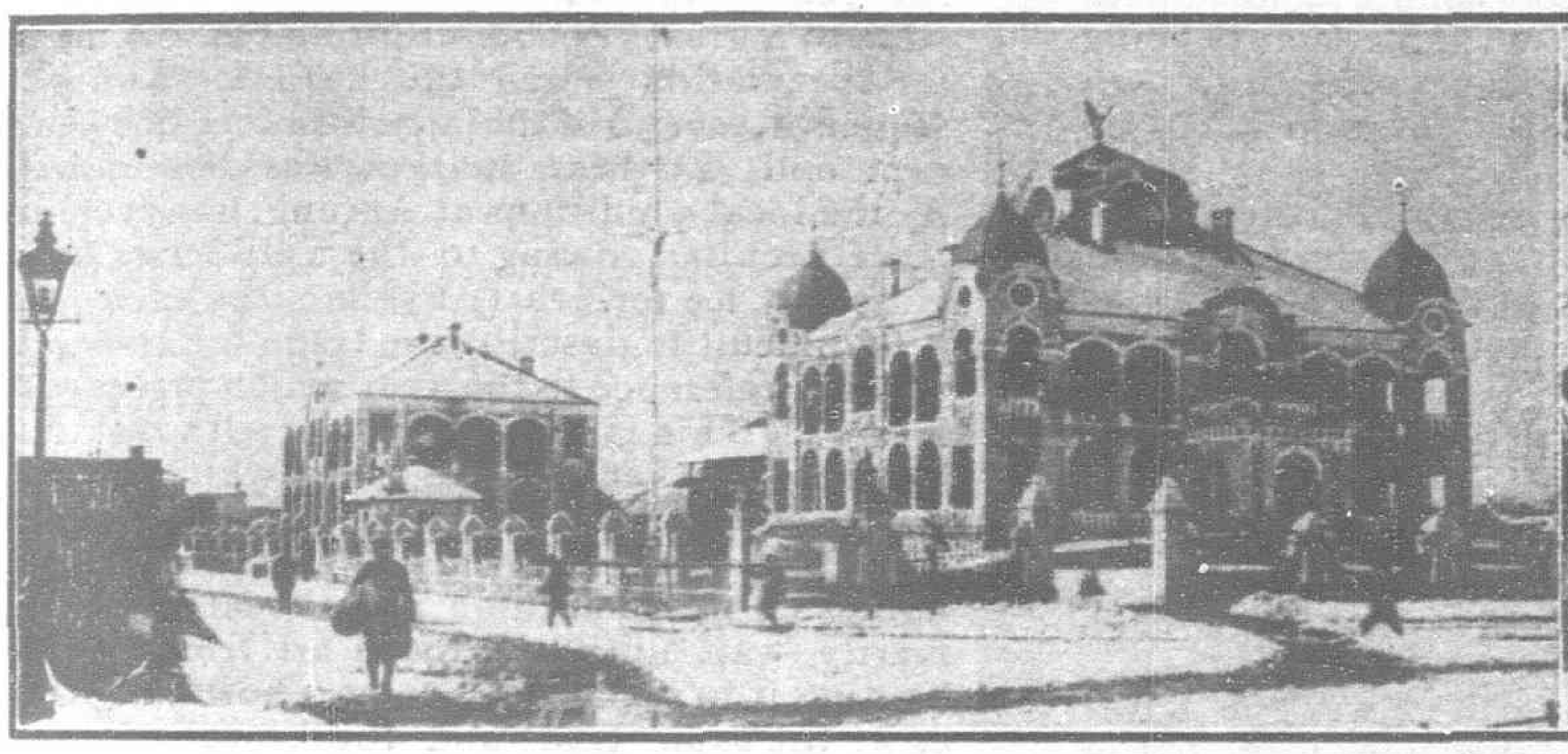
THE RUSSIAN CONCESSION

American engineers were engaged in surveying the railway line from Yunnanfu, Yunnan Province, to Suifu, Szechwan Province.

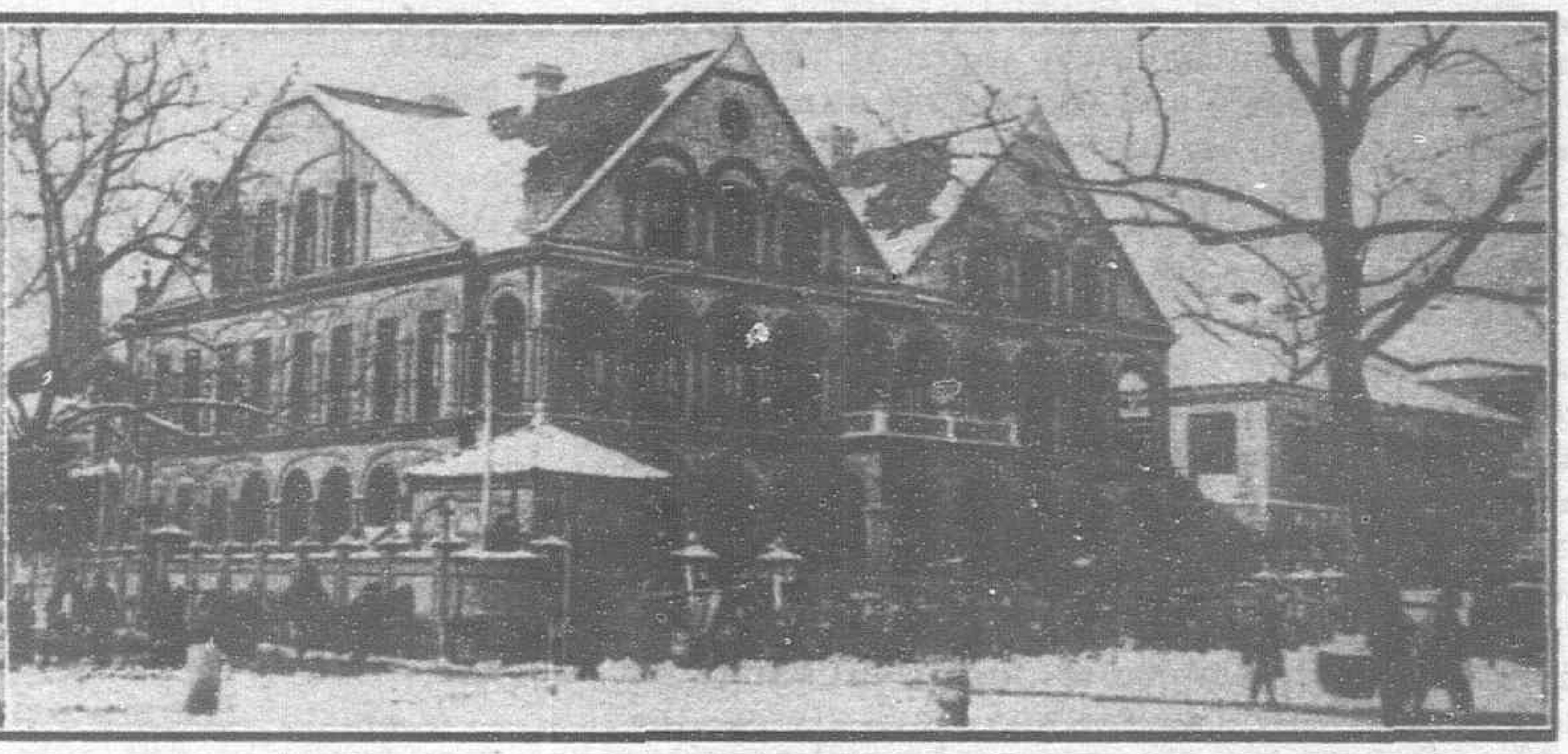
The local electric light company commenced operation in September and at the close of the year had installed about 3,000 lights of 16 and 32 candlepower, the rate being $1 (Mexican) per lamp per month. The company seems to be experiencing some difficulty in installing its lights with the native shopkeeper, who apparently prefers the kerosene-oil lamp for the present.

The silk industry is now the leading one of the Province. The viceroy has instituted about 100 so-called schools of sericulture in the Province, 7 of which are located in Chungking. A French expert has been retained to supervise this important work, and as an incentive to the increase of the industry all fine silk intended for export is to be free from likin collection.

There are 10 match factories in this district, 6 of which are in Chungking. Their total 1910 output was estimated at 24,630 cases of 7,200 boxes each, valued at a little over $200,000. The factories run only five or six months during the year, employing about 800 workmen. Through mutual agreement the output is regulated, and an annual profit of $4 000 or $5,000 per factory is thus assured.



HANKOW: GERMAN CONCESSION



THE YOKOHAMA SPECIE BANK

Chungking has 12 window-glass factories, having a combined yearly output of about $30,000, and 9 or 10 factories making lamp chimneys. For both of these commodities there was a good demand during the year. The product turned out is of inferior quality, but seems to be adequate for local needs. Another factory turned out fancy, plain, and colored glass ornaments, worth about $15,000; some 60 men are employed in this factory, and considerable cleverness is shown in the manufacture of fancy ornaments of foreign design.

There are three industrial schools in Chungking, one for teaching various trades to the youths of the community, one for adult beggars, and one for child beggars. In these institutions various trades are taught, the articles manufactured consisting of furniture of all kinds, clothing and cotton goods, boots and shoes, brass ware, etc.

HANKOW.

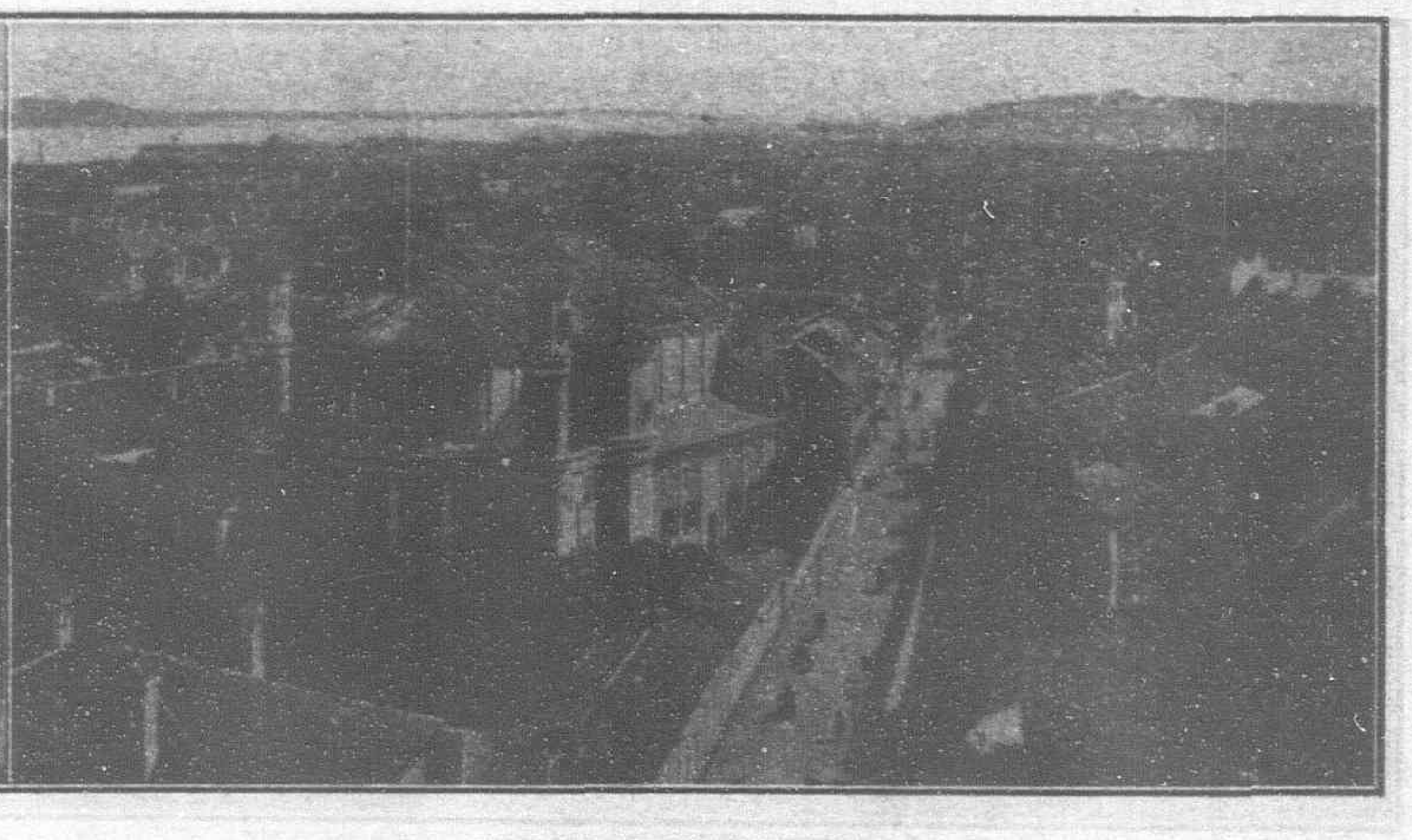
[BY CONSUL GENERAL R. B. MOSHER.]

Local Industries.—The year 1910 was the third working year of the Yangtze Engineering Works. It made great progress, and is now one of the most important industries in Hankow. During the year the works executed a number of big orders for steel vessels, tugs and lighters, railway bridges, points and crossings, steel structural work, repair work, etc. The workshops were enlarged, and in the first part of 1911, in order to meet the ever-increasing demands of customers (foreign and Chinese), further extensions, particularly of the foundry and bridge yard, were carried out, and additional tools, including one gas engine and dynamo with gas producer, were installed. A slipway at the back of the works was also built for docking vessels up to about 125 feet in length.

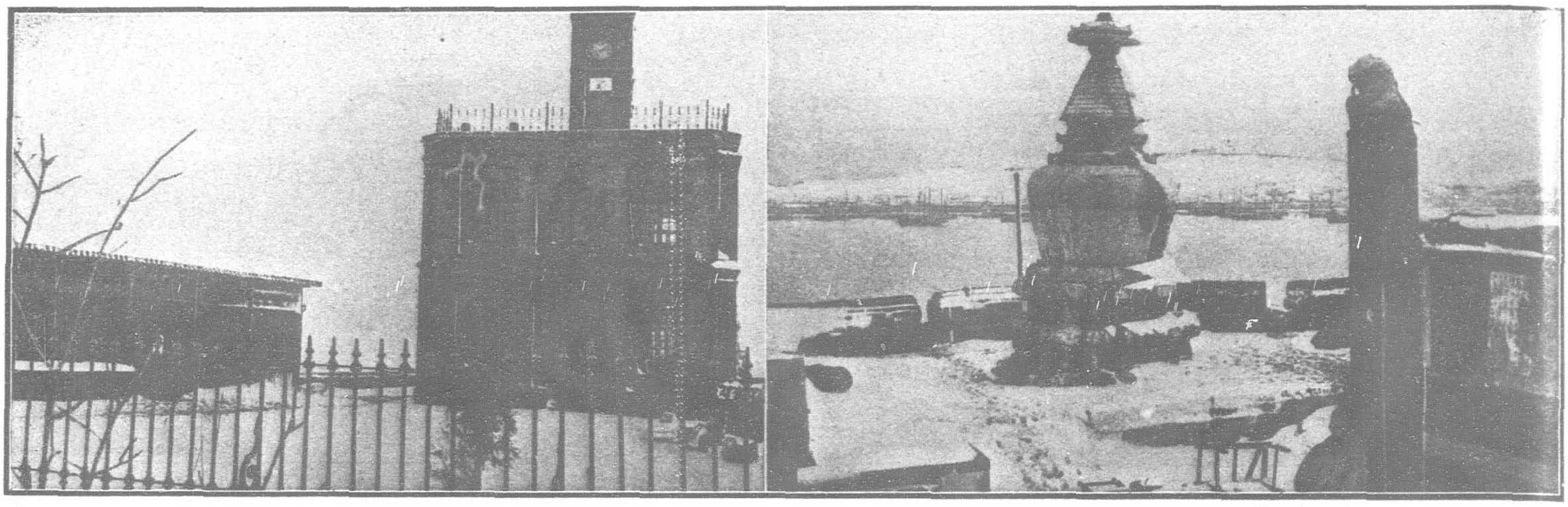
The output of pig iron of the Hanyang Iron and Steel Works in 1910 amounted to 130,000 tons, of which 14,034 tons were exported to Shanghai and other Chinese ports, 29,167 tons to Japan, and 15,100 tons to the United States. Shipments of rails and fastenings aggregated 33,200 tons, some 5,000 tons more than in 1909. A new blast furnace was opened May 4, 1910.

Iron and Coal Output Shipping.—The output of the Tayeh mines in 1910 was 303,076 tons. The Pinghsian coal mines turned out 640,000 tons during the year from which 170,000 tons of coke were made, the rest of the coal being exported. The Hanyang Iron and Steel Works took

HANKOW: THE BUND AT LOW TIDE



THE BRITISH CONCESSION



WUCHANG. THE KOKOKURO.

most of the coke and 77,839 tons of coal, while 18,000 tons of coke and 215,000 tons of coal went to Hankow of which 8,600 tons of the latter were sent abroad. Coal amounting to 47,560 tons for bunker supplies was shipped to steamers calling at Hankow.

SHANGHAI.

[By Vice and Deputy Consul General W. Roderick Dorsey.]

The Railway Traffic.—The completion of the through line to Hangchow in the summer of 1908 gave increased traffic facilities to a fertile and populous district to the south of this city. It is said that large and increasing numbers of passengers are being hauled, but owing to likin restrictions the forwarding of foreign goods over this line is still greatly hampered.

The passenger traffic of the Shanghai-Nanking line, or, as it is locally called, the Huning Railway, showed a marked increase over the previous year, 4,489,720 passengers having been carried as against 3,527,106 during 1909, the gain being partly due to travel to the Nanking Exposition. The railway becomes more popular with the masses each day. During the year arrangements were made with the Yangtze River steamship companies for interchange of their tickets with the railway, thus giving the holder the option of traveling by rail or water to or from Chinkiang or Nanking.

Freight earnings, because of likin restrictions, represented but 10 per cent of the total earnings of the road. Negotiations are in progress to enable native goods, under Chinkiang and Shanghai transit passes, to be carried by rail under the same conditions as they are now handled by steamer.

The gross earnings of the line were $2,018,348 Mexican and expenditures $1,390,678 Mexican. In January a hospital was opened here in conjunction with the railway, and in June the arrangement with the Chinese Telegraph Administration was canceled and a telegraph line constructed along the entire system.

The competition of the railways continues to affect the carriage of passengers by steam launches on the Soochow and Hangchow runs. For travel to Europe the Siberian route grows in favor, and from the increased number of applications for passports at this consulate general, it is evident that Americans also find that route attractive when returning home.

New Mills—Improvement of Hwangpu River.—During 1910 the new manufactories established included a flour mill, equipped with American machinery, and a candle factory, with British machinery, another candle factory being under construction and a third projected, both to be supplied with German machinery. Two cotton mills increased their loom installation, British machinery being used. In the Chapei district the construction of an electric power station and the reservoir of the new waterworks were expected to be completed before the end of 1911.

This office is informed that in all the instances cited the orders for machinery and materials were placed with firms locally represented, a fact which well demonstrates the futility of trying to obtain contracts without agents on the spot.

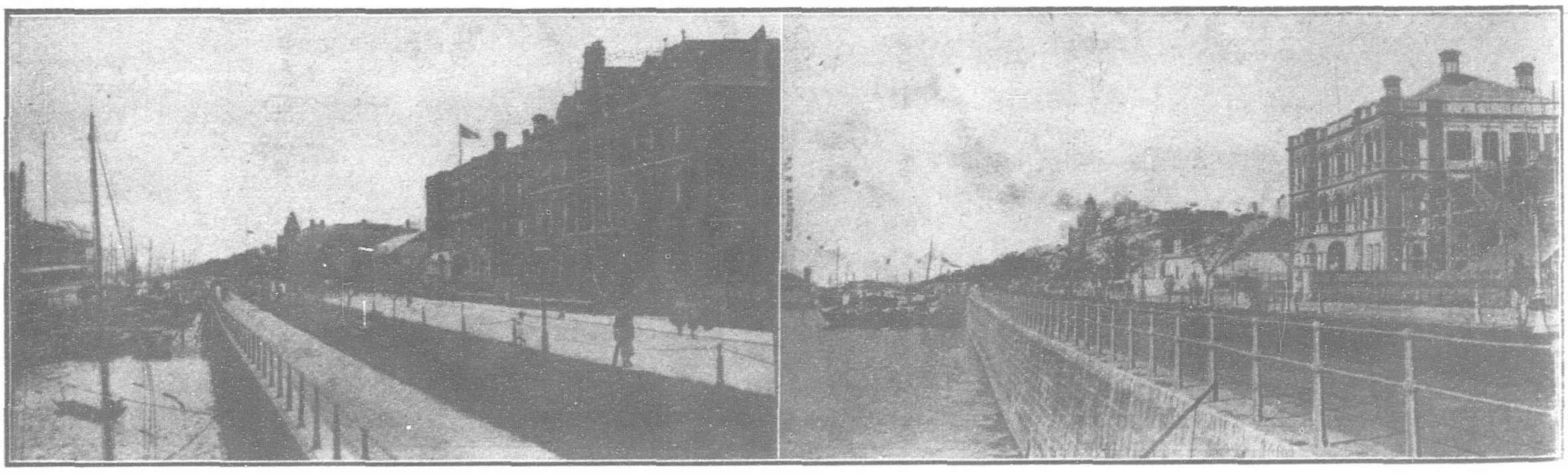
A scheme for improving the Hwangpu River was partially put into effect in 1910, but in November the conservancy board called a halt in the work, and the engineer in charge and his technical staff were dismissed. The closing of the old ship channel, the dredging of the Astraea Channel, and the construction of a concrete training jetty at Woosung are said to have resulted in an unobstructed channel from the anchorage outside Woosung up to the city of Shanghai, straighter, shorter, deeper, and broader than the old route; the outer bar has disappeared and in the channel there is a low-water depth of 21 feet with ample room for two vessels to pass at any part. The original plan contemplated other training works which were well under way when operations were interrupted. Foreigners realize that the commercial fate of Shanghai depends on its river and it is hoped arrangements may be made by which the conservancy work may be continued.

ANTUNG.

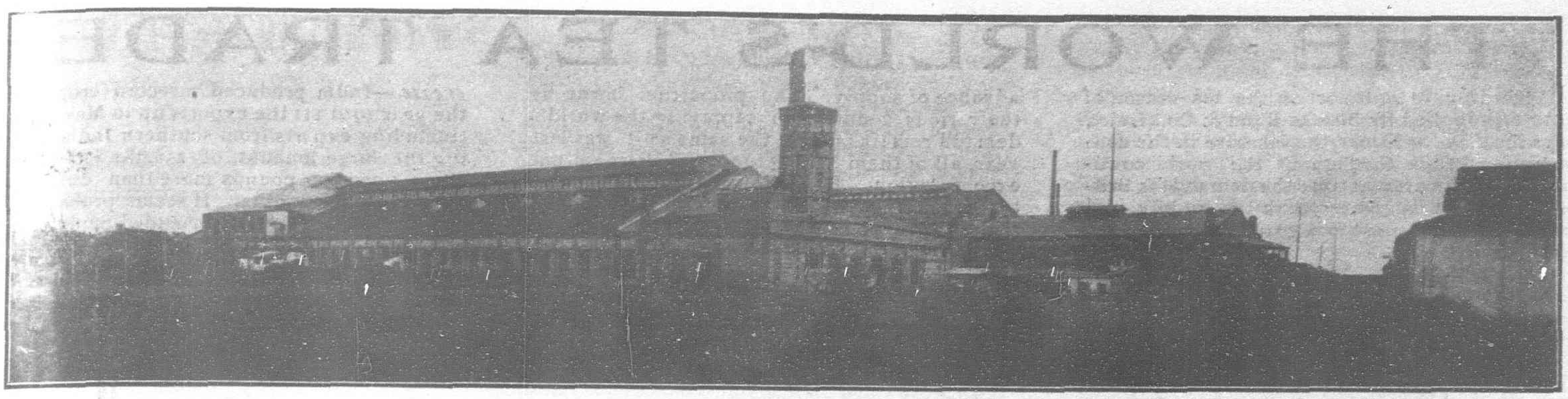
[From Consul E. Carleton Baker.]

Bean Products—Timber.—Although the bean crop in 1910 was about 20 per cent above the average and the quality was better than usual, the year's transactions in this staple article were to a great extent unprofitable. A mania for speculation seized the dealers. As a consequence, several of the large firms became bankrupt and the bean market was demoralized. As the local conditions at Antung, however, are quite peculiar, owing to the Yalu River being closed by ice for nearly five months each year, it is difficult to describe the trade for one year without reference to the year which precedes or follows. This is especially true with regard to the bean market, for the beans which are produced in one year are generally not exported until the year following. The bean crop is harvested in the autumn, and the farmers customarily wait until the roads are frozen before hauling it to market. The river, however, freezes at the same time and the beans are consequently held at Antung until spring. Meanwhile they are mostly sent to the mill and converted into bean cake and bean oil, the former article figuring chiefly in the export trade, large quantities of the latter being consumed locally. In view of the foregoing explanation, and the fact that the bean crop of 1909 was below the average, it may not be surprising to note that, in spite of the large production in 1910, the export figures for that year show a decided decrease.

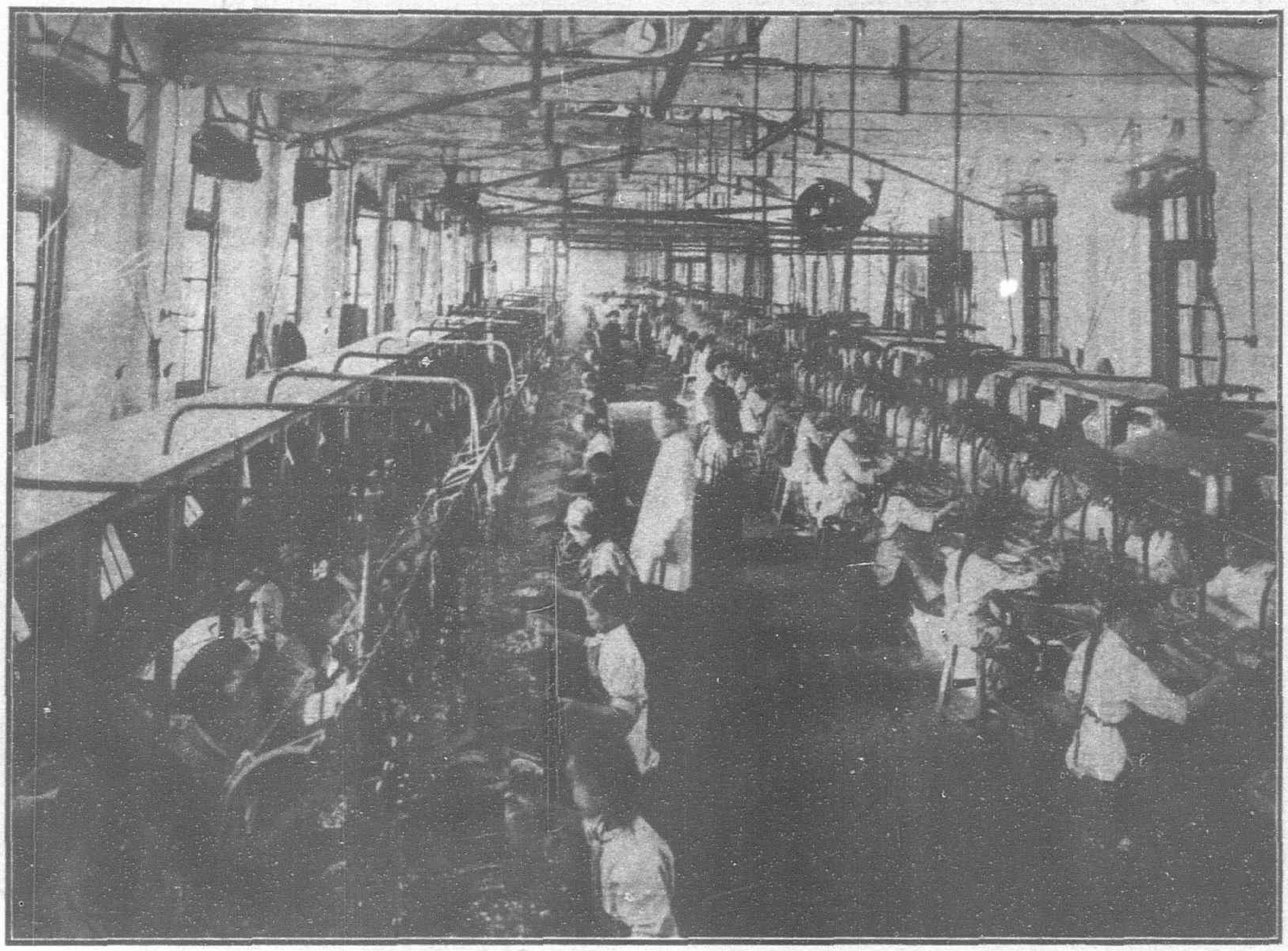
The trade in timber at Antung has an important bearing on the general business of the port, as more persons are interested in this industry than in any other. The showing made during



HANKOW: THE BUND.



MILL OF THE SHANGHAI COTTON SPINNING COMPANY



SHANGHAI: THE EWO MODEL SILK FILATURE

1910 was far from encouraging. There was a congestion of the wood market at Antung, and over half of the wood produced remained unsold. There is, in fact, a great deal of wood on hand which is several years old, and much of it is rotting.

The Antung-Mukden Railway.—Extensive and important railway improvements took place in this district in 1910. The old Antung-Mukden Railway, which had but a 29-inch gauge, has been largely reconstructed so that it may be used for standard-gauge traffic in connection with the South Manchuria Railway and the Korean railway system. While it formerly took 36 hours to go from Antung to Mukden, it now takes less than 18, and when the work of reconstruction is complete it will require not more than 6 or 7. About half of the distance is now broad gauge and by November, 1911, the whole line will be finished.

Most of the bridges and the broad-gauge rolling stock now used are of American make, while the rails and ties were manufactured in Japan. The Yalu River bridge which is to connect Manchuria and Korea is a work of the greatest importance, for through trains will soon pass from one country to the other without the slightest hindrance or delay. It is estimated that the total cost will be in the neighborhood of $1,200,000. The steel work will all be American and will cost about $300,000. The bridge will have a draw which will swing on the ninth pier from the Korean side, there being 12 piers in all. The steel caissons which were used in building the piers were made in Japan; also the engines which were employed. The total length of the bridge will be about 3,000 feet, with six 200-foot spans and six 300-foot spans. There will be but a single railway track across the bridge with a road and a footpath on each side.

New Enterprises.—There has been a general expansion lately along several lines and a number of new works are projected. Many new bean-cake mills began operation during 1910 and extensive improvements were made in several of the old ones. Most notable of these is a large Japanese mill equipped with modern machinery. It now has 12 hydraulic presses and 48 screw presses, while a new type of suction gas engine and a complete set of steel rollers have been added. The capacity of the mill has thus been increased to 2,000 cakes and about 13,300 pounds of bean-oil per day.

A new sawmill has been started by a local British firm and another is contemplated by the Chino-Japanese timber monopoly. As freight rates on goods from Antung are generally based on cubic measurements, it is obvious that finished boards and planks could be shipped to greater advantage than rough timber. The new sawmills will therefore promote the export of wood to a considerable extent and make the trade more profitable.

Two new hospitals are now in the course of construction and, when finished, will do much toward promoting the general health of Antung. One is being erected by the Danish Mission and the other by the South Manchuria Railway Co. The latter will be by far the larger of the two and will cost not less than $100,000. It will consist of nine or ten buildings, and will be thoroughly complete and up-to-date. The main building alone will cost $30,000.

A waterworks system is projected and will cost, it is said, about $750,000. This will be constructed by the South Manchuria Railway Co. As the present water supply is extremely poor, the new system will be a most valuable and necessary improvement. The electric-light system, which is now also under railway control, will be extended, and, since the rates have been materially reduced, it will probably enjoy a much larger patronage than formerly. A modern cocoon-reeling factory is under consideration, the capital to be $25,000.

HIGH DUTY PUMPING ENGINE.

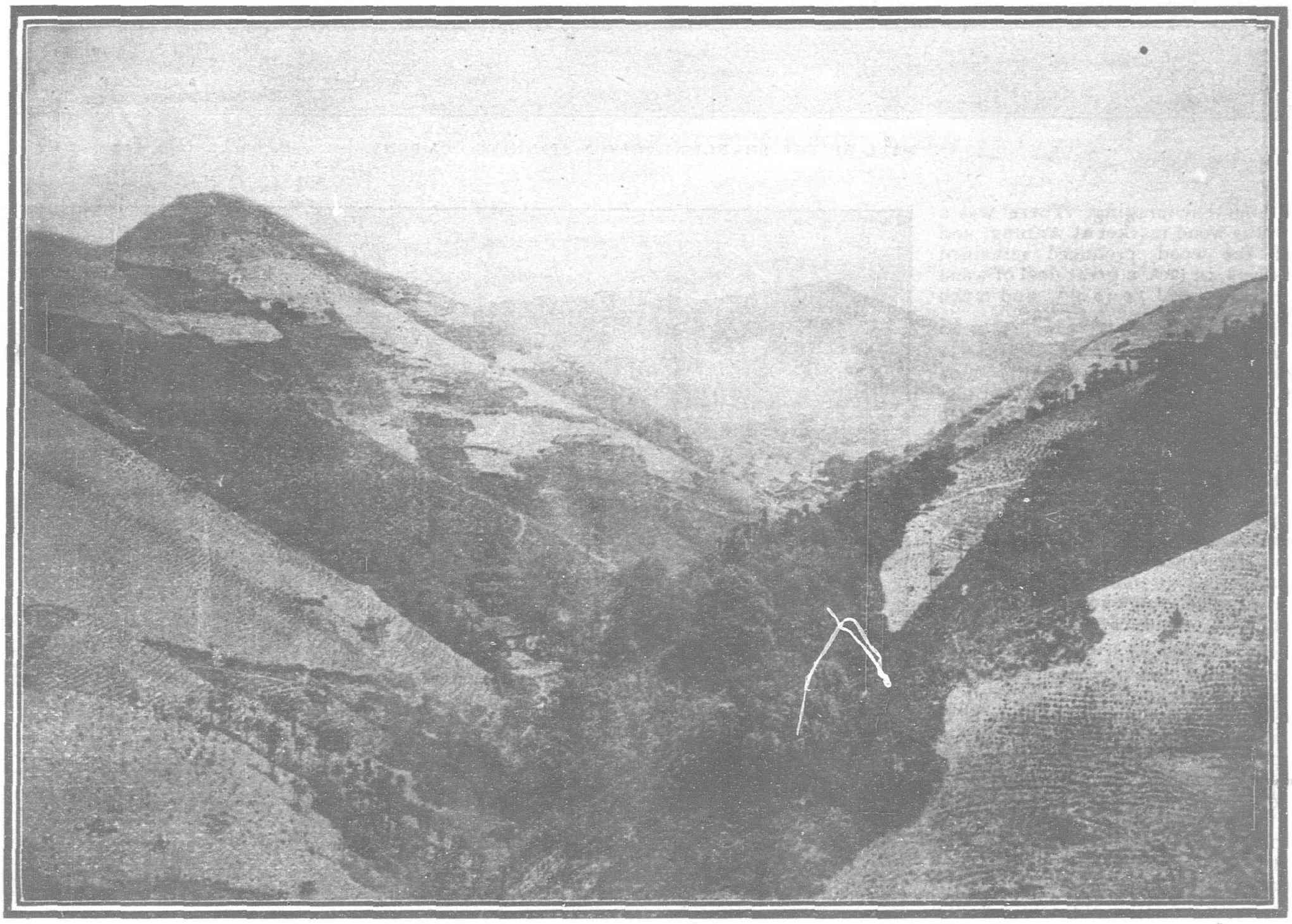
Henry R. Worthington, 115 Broadway, New York City, has just issued bulletin W-188, giving an extended description of the Worthington horizontal, triplex-expansion, high-duty pumping engine installed in the Hope Station of the Providence, R. I., Water Works. This engine has a capacity of 10,000,000 gallons per 24 hours against a head of 85 lb. per square inch and its design represents the latest practice in pumping engines of this type. One of its especially interesting features is its high-duty attachment involving the use of compensating cylinders taking the place of a flywheel. The arrangement is preferable to a flywheel in that the power exerted increases in almost exact ratio with the decrease of the power of the expanding steam. The account given of the duty trials shows that the guaranteed duty was exceeded at full load by 4.5 per cent. and at reduced capacity by 12.5 per cent. The actual duty at full load was 149,000,000 foot-pounds per 1000 lb. of dry steam. The bulletin also shows and describes a similar engine installed at Fall River, Mass. The bulletin will be especially interesting to municipalities facing the problem of securing adequate pumping service economically.

PANAMA ELECTRIC RAILWAY

Panama Electric Tramways.—The firm of C. G. Young, Engineers-Contractors, 60 Wall Street, New York, have been engaged as Consulting Engineers to design and supervise the construction of the System of the Electric Tramways to be installed in Panama City, Republic of Panama, with extensions in the Canal Zone. Mr. Young made the examination and report last year, upon the basis of which the Tramways are to be built. The work is being put in hand at once and contract has already been given out for the local construction work. The system will comprise about ten and one-half (10-½) miles of tracks and about fifteen motor cars.

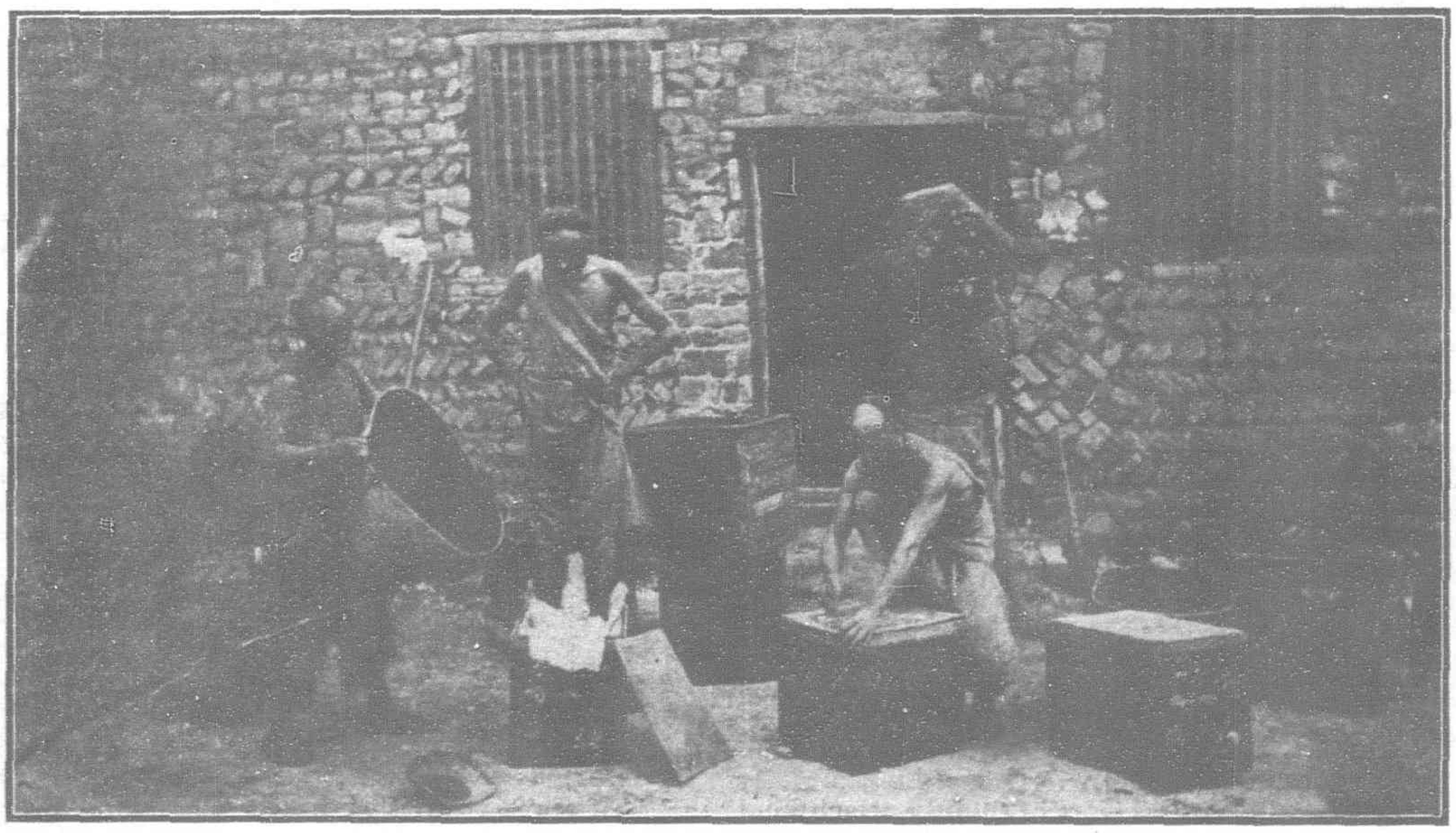
THE WORLD'S TEA TRADE

According to a report on the tea season of 1910-11, supplied by Brooke Bond & Co. (Ltd.), says the *London Times*, the increase in the consumption of tea throughout the world continues. At the present time the demand for British-grown tea is greater than the supply, and prices have been paid this year for common tea which have not been equaled for 20 years. The average price for all tea has also risen considerably.



TEA DISTRICT BEYOND ICHANG

Rather more than four years ago consumption overtook supply. Since then production has continued to increase, but consumption has increased still faster, and is now distinctly in advance of supply. The proportion borne by the various countries in supplying the world's demand remains much the same as it was last year, all of them having increased their output except Ceylon. By far the greatest part of the tea concerning which there are reliable statistics is grown in India and Ceylon, most of the remainder coming from China, Japan, and Java. Small quantities are also grown in Natal, Nyasaland, Burma, the Straits Settlements, Brazil, Mauritius, Queensland, the Fiji Isles, and the Caucasus. A little is grown in Annam, of which part is exported to France.



PACKING TEA IN THE INTERIOR

British-Grown Tea—China's Exports Increase.—India produced a record crop during the year 1910 11; the exports up to May 31, 1911 (including exports from southern India), reaching the large amount of 258,384,800 pounds, about 4,000,000 pounds more than during the preceding 12 months. It seems probable that returns for the 12 months ended September 30 will show that the increase is even greater, and that the crop of 1910-11 is as much as 15.000,000 pounds ahead of that of 1909-10. Practically all the tea sent from India and Ceylon to China consistsof dust and siftings which are manufactured, in factories belonging to Russian firms, into "brick" tea for consumption in Asiatic Russia. The admixture of 10 to 15 per cent of the strong liquoring dust from India and Ceylon greatly improves the "bricks" and facilitates their sale. The area under tea in India did not increase much during the year. The difficulty of obtaining coolies is so great that most planters now devote their attention rather to increasing the productive power of the existing area than to extending it.

Up to the end of 1910 the total exports from Ceylon had fallen over 10,000,000 pounds. During the early months of 1911 they recovered considerably, but not to an extent sufficient to bring the amount nearly up to the record output of 1909-10, which was approximately 192,000,000 pounds. The deficit is attributed partly to drought and partly to the greater attention given to rubber. Some experts think that with favorable climatic conditions the output of Ceylon will remain at about the same level for some years to come; for although the increase in rubber planting tends to reduce the area under tea, better cultivation increases the yield of the existing gardens. Also, there is much high ground in the island very suitable for tea where rubber can not be grown. About 61 per cent of Ceylon's crop is taken by the United Kingdom, the remainder mostly by Russia,

(*Continued to page 321*)

THE FAR EASTERN REVIEW

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THE FAMINE IN CHINA

The Central China Famine Relief Committee which is making the present appeal for funds to relieve famine conditions, especially in North Kiangsu and Anhui, takes the place of the three Committees which existed last year, and is doing its work along certain new lines.

In previous famines, although it was recognized as desirable to give relief chiefly in return for work, and this was to a considerable extent carried out, for the larger part rice was simply given away to those in need, and little attempt at preventive measures was undertaken. The distinctive thing about the present Famine Committee is its ambition to become the last of its kind in China. Its desire is to create a public sentiment that will throw upon the New Government the full responsibility for undertaking a programme of conservation, and to make the work which the Committee does this year the beginning in such a programme. It is the object of the Committee not only to secure money in China and abroad for famine relief in the form of work, but to influence the Government to spend its money in the same way, so as to avoid pauperization in saving life, and to prevent the recurrence of famine.

The missionaries living in the famine districts have felt keenly the burden of continued famine relief year after year, which breaks into the continuity of the regular work carried on at their stations. At a meeting of missionaries at Kuling during last summer, they decided upon a policy of no relief without work, except in the case of those incapacitated for work, and appointed representatives to push the organization of a new committee.

This Committee is made up of Chinese and foreigners in equal number. Some of the leading business interests in Shanghai are represented on the Executive Committee. The Treasurer is the Manager of the International Banking Corporation.

The following is a list of the members of the Executive Committee:

The Rt. Rev. F. R. Graves, D. D., of the American Church Mission, Chairman.

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Yih Ming Tsar Esq., Piece goods merchant.

Yuan Heng Kee Esq., International Banking Corporation.

Yu Ya Ching, Esq, Netherlands Trading Society.

Offices:—16 Kiukiang Road, Shanghai, China.

Hankow had suffered from flood before the beginning of the Revolution and there was every promise of great suffering during the winter. On top of this came the misery incidental to war, and the final calamity of the burning of the city. This was followed by looting. Since the evacuation of the city by the Imperial troops refugees are flocking there in great numbers in the hope of receiving food and help.

The situation there has appealed especially to the Chinese, and considerable amounts of money have been given by them for the relief of those rendered homeless.

The Hwai is a river without a mouth. Many years ago it had one and flowed to the sea as the habit of rivers has been from time immemorial. Then it happened that the Yellow River, China's sorrow, in one of its wanderings took possession of the lower part of the Hwai River as its outlet to the sea. With the immense quantities of mud which it carries, the Yellow River soon silted up the old bed of the Hwai, so that whole region was above the level of the Hung Tse Lake through which the Hwai flowed, and the Yellow River had to be dyked. Later, the Yellow River changed its course, and now enters into the sea hundreds of miles to the north of its old mouth.

The Hwai River was thus left stranded, and had to make its way to the sea through the grand canal and many marshy windings which are hardly adequate to take care of its ordinary flow. When a rainfall of sixteen to thirty inches in a couple of days occurs in its basin as it did last year or when the same thing happens in the district silted up by the Yellow River, the result is the flooding of the whole region.

Such conditions have caused the floods and famines of the last two years and brought nearly two millions of people face to face with starvation. Mr. C. D. Jameson, the engineer sent out by the American Red Cross Society, has reported that a mouth can be provided for this river, and future famines averted by a great engineering scheme.

Meanwhile, although the river has no mouth, the people living along its banks have, and nearly two millions of them have been for weeks without proper food.

His Excellency Chang Chien, former President of the Provincial Assembly of Kiangsu, in which province Shanghai is located, and Minister of Agriculture and Industry in the cabinet of the provisional Republic, has been for many years interested in the problem of reclaiming the Hwai River valley, where for many years famine conditions have been almost continuous, and nearly two million people are now facing starvation.

He has trained a number of Chinese as surveyors, and under his direction great progress has been made in the survey of the waterways of North Kiangsu.

He is pledged to its reclamation as part of his life work, and with him is co-operating the engineer sent out by the American Red Cross Society, Mr. C. D. Jameson. A number of Chinese engineers have volunteered to help in this work, and it is the policy of the Central China Famine Relief Committee to give food, to those able to work, only in return for labor on dykes and canals of a sort that will fit into the larger plans which are being formulated.

The Central China Famine Relief Committee is putting into operation in China the "Test Works" plan of investigating famine conditions as developed by the British Government in India.

The Hon. G. G. White, chief engineer of the Public Works Department for Burmah, thus describes the plan: "In order to know where and when to open famine relief works, test works are opened in the scarcity tract, which immediately make clear whether famine relief work is really required. Often it happens the people from the nearest villages come into the works, stay a few days, find that they must work hard, and leave; plainly showing there is no real famine. If they remain, and recruits keep coming in, they are taken care of by extending the work."

This plan is being put into operation in the Ningpo district and will be used elsewhere wherever any question is raised as to real need for famine relief. In most places, however, the desperate need is beyond question.

In India there has often been great difficulty in finding suitable work to do, and much of the work done by the Government in relieving famine has been of a useless nature. In China there is an abundance of work to be done in repairing dykes and digging canals which will be of permanent value in preventing future floods and famine.

Money given to the Central China Famine Relief Committee will not only itself save life, but will lead to the employment by Chinese land owners of many who would otherwise perish.

Money may be sent by handing it in at your bank for transmission to the Treasurer of the Central China Famine Relief Committee through the International Banking Corporation, New York.

SIR FREDERICK LUGARD'S NEW APPOINTMENT.

The announcement last month that Sir Frederick Lugard, Governor of Hongkong, had been appointed Joint Commissioner of Northern and Southern Nigeria was received with sincere regret by the British Colony while acknowledging the recognition of his ability by the British government in selecting him for the important work of uniting the two divisions of Nigeria under one administration. He returns to the scene of his early labors, where he first earned the name of Empire Builder.

Following his appointment came the announcement that Sir Henry May, formerly Colonial Secretary at Hongkong for over nine years and at present Governor of Fiji and High Commissioner of the Western Pacific, would succeed to the Governorship.

Sir Frederick Lugard's career as an empire builder began in 1888 when he commanded an expedition against slave traders on Lake Nyassa, East Africa; from 1889-92 he served the British East African Company in command of the exploration of the Sabahi and as administrator of Uganda; in 1894-95 with the Royal Niger company in Command of the expedition to Borgu to negotiate treaties; in 1896-96 he was in charge of an expedition for the British West Charterland to Lake Uganda; in 1898-99 he was H. M. Commissioner for the hinderland of Nigeria and Lagos and in command of the Western African Frontier Force; 1900-06 he was High Commissioner of Northern Nigeria with the rank of brigadier general. Then followed his appointment as Governor of Hongkong. During his five years service in Hongkong he has been identified with every progressive movement and demonstrated his remarkable ability as an administrator and executive.

His recent appointment is a striking endorsement of his early work in Nigeria where he goes to complete the work that he initiated in the eighties as pioneer. Sir Frederick was referred to by Earl Grey as "the greatest asset Nigeria possesses." He was a believer in utilizing the agency of native chiefs in extending British rule. Native customs and social traditions were thus respected and friction avoided. This policy has been fully justified in results, and may be said to have been generally adopted in Britain's colonial policy.

Sir Frederick is a firm believer in the grave responsibility of the nations of the temperate zone in their relation to the tropics. He is sincerely opposed to the selfish exploitation of tropical areas, and, by his advice and example, makes clear that no exploitation is justified where the welfare and development of tropical peoples are ignored or their interests sacrificed.

THE FILIPINO AS A CRAFTSMAN.

The success of the Bureau of Printing of the Philippine Islands in evolving an efficient organization of Filipino craftsmen from the crudest possible material, is a striking evidence of the capacity of the Filipino to develop into a capable workman under intelligent, efficient supervision.

When Director John S. Leech arrived in Manila in 1901 to organize a printing office for the Philippines, he found knowledge of the craft in the islands confined to a few Spaniards and a sprinkling of Tagalogs in Manila and some of the larger cities of the archipelago. His instructions included not only the installation of a plant to handle the government work but required him to provide for the instruction of Filipinos in the printing trades.

In reviewing the progress made, evidence of the success attained in developing competent craftsmen is found in the gradual reduction of the percentage of Americans, and the steady increase of Filipinos employed in the Bureau as shown by the pay rolls covering the period from 1901 to 1912. In 1901 the percentage was 34.1% American, 65.9% Filipino, and at the present writing there are 5.9% American and 94.1% Filipino. The number of men employed has increased from 187, of whom the greater number of Filipinos were apprentices, to 428 in all at the present time, an evidence of a steadily increasing efficiency among the Filipino craftsmen in the marked reduction from the original American supervising force.

Some of the difficulties that have been successfully surmounted are referred to in an article by John F. McCabe in the *Printing Trade News* of March, 1911, an excerpt from which follows:

"When the edict, 'Teach the natives the printing trades', went forth, the magnitude of the undertaking seemed startling to those best acquainted with the conditions under which the instruction would necessarily be imparted. A consensus of opinion, if secured from those who were the first instructors, would have stifled the attempt. There were a Babel of languages—no common medium of communication—the dialects of the Philippines being as foreign to each other as Greek to Sanskrit. In some cases the inhabitants of adjoining towns, where the same dialect is in use, have difficulty in understanding each other because the people are so circumscribed in their local affairs and civilities. The apprentice from the Visayas could not converse with his Ilocano co-worker; the Pampango could not understand the Tagalo. Such was the condition existing among all of the representatives of the different peoples—Pangasinan, Bicol, Zambales, Cagayan, etc. But the projectors planned not for defeat. Their work was begun in the spirit of faith and continued in hope; the ground had to be tilled and made ready for the intellectual sowing. The expected difficulties were met and overcome by diligence, patience, and concentration of purpose. Apprentices were required to attend English night schools, their technical instruction in the bureau was of an order that appealed to the intellect to grasp and not to the eye to copy, with the result that at this time every mechanical operation in the Bureau of Printing is performed by native Filipinos under the supervision of American craftsmen instructors. All of the Christian peoples and the remotest provinces of the islands are represented in the bureau. English is the language substituted for the many dialects and the native is acquiring an education as well as a useful trade. Eight trades are taught, and there are eighty or more apprentices under instruction in the various divisions at all times."

Concluding his article Mr. McCabe says:

"To summarize, the Philippine Bureau of Printing is a large producing establishment as well as a trade school. Its product is manufactured more economically than work of a similar kind in the United States, although all materials consumed are imported from a base of supply located 15,000 miles from Manila, and it pays the liberal gratuities allowed all government employees. It has aroused the native to active interest in healthful outdoor athletics by making the baseball field more attractive than the cock pit. It is fostering thrift by influencing them to become regular depositors in the postal savings banks. It has received the gratitude of leaders of the Philippine people for its efforts in training boys to become useful citizens, and, in general, it is an institution which is a credit to the American government as well as a monument to the executive genius of its organizer and director, Mr. John S. Leech."

The period of training covers four years divided into six class periods of six months each, and one of one year. At the end of three years, if proficient, the apprentice is advanced to junior craftsman, and, if he qualifies, is graduated as craftsman at the end of the fourth year. The varied character of the work of the Bureau gives ample range for the most ambitious islander, covering as it does every branch of the printer's craft from the composing room to the bindery and including training in the most modern practice in photo-engraving, electrotyping, letter press embossing, etc.

The natural tendency of tropical peoples, as found in native environment, without incentive to continuous application, is to work at irregular intervals and only when the necessity of acquiring food forces them to activity. In the early days of the Bureau this inclination greatly retarded progress in instruction. It is true that working in the new atmosphere of activity had the effect of developing diligence on the part of many, but the irregularity of the majority proved a source of great discouragement. Even strict regulations to curb the evil proved unsatisfactory. Finally, in 1903, Director Leech evolved a bonus system designed to meet the situation and serve to encourage the Filipino apprentice and craftsman to habits of thrift, of industry, and of greater attachment to the trade. It was realized that the government as well as the apprentices would benefit, if efficiency, economy, and co-operation could thus be fostered. The system met with the approval of, and was authorized by, the Philippine Commission in 1903 by the following act:

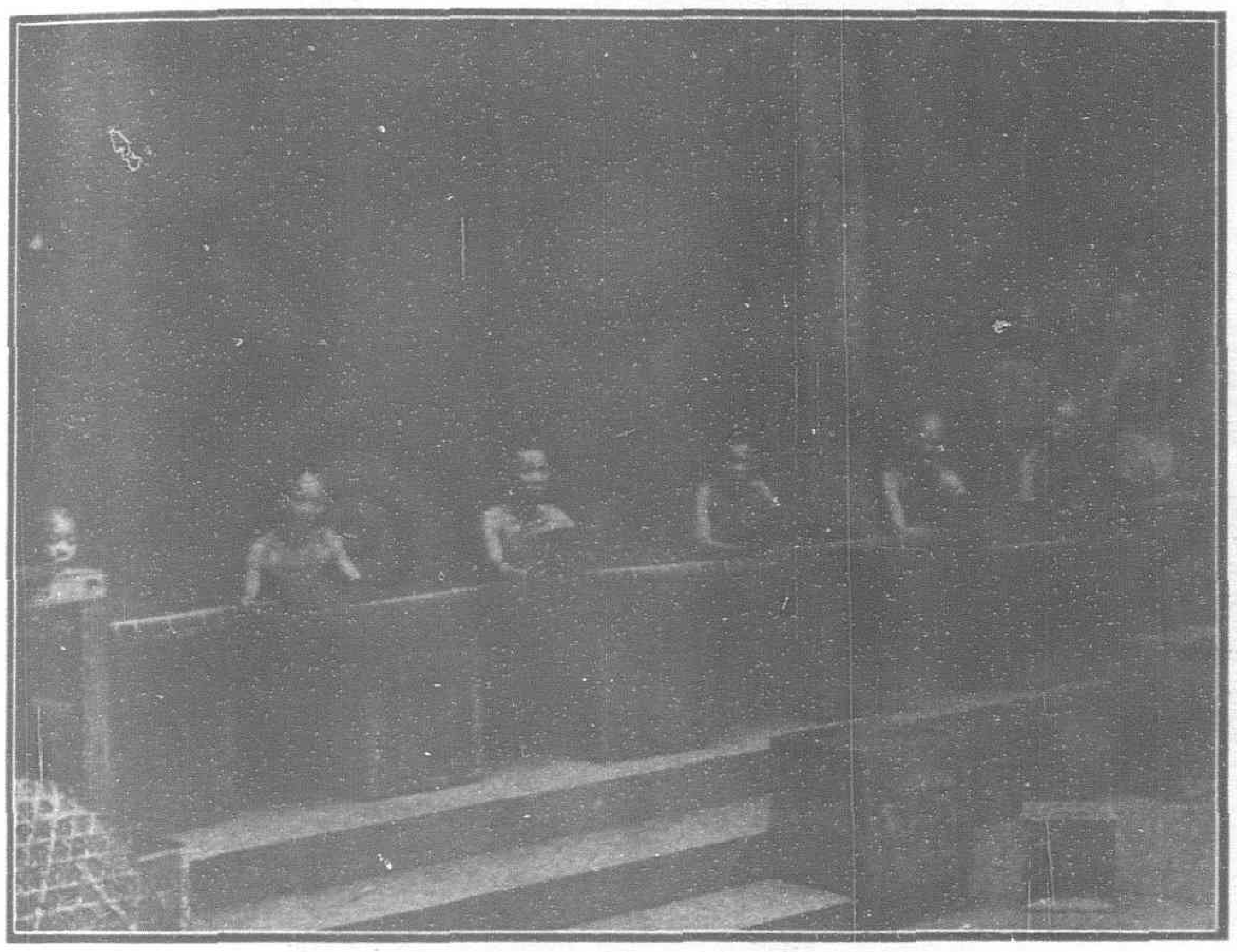
"Native craftsmen from the date of their entrance into the service, and native apprentices from the date of their entrance into the third year of apprenticeship, for each year of honest, faithful, satisfactory, and continuous service in the Bureau of Printing shall be entitled to receive, at the end of the next succeeding year of honest, faithful, satisfactory, and continuous service, extra compensation as follows: Twenty centavos per diem for each full day of actual service rendered at a daily wage of one peso and twenty centavos or more but less than two pesos and forty centavos; forty centavos per diem for each full day of actual service rendered at a daily wage of two pesos and forty centavos or more but less than three pesos and twenty centavos; and sixty centavos per diem for each full day of actual service rendered at a daily wage of three pesos and twenty centavos or more. A native craftsman or apprentice separated from the Bureau of Printing after such extra compensation has been earned and before it becomes due shall not be entitled to receive any part thereof unless such separation shall be on account of lack of work, permanent disability, or death, in which event such native craftsman or apprentice or his estate in case of death, may, on the recommendation of the Director of Printing, approved by the Secretary of Public Instruction, receive the extra compensation accumulated at the time of separation. For the purposes of this section the services of native craftsmen and apprentices shall be deemed continuous until such craftsmen and apprentices are definitely separated from the service in the Bureau of Printing".

The bonus system has more than fulfilled the expectations of its promotor. Today, there is no printing establishment in the Far East that can compare in point of excellence of typographical output or efficiency with the Philippine Bureau of Printing, a demonstration that of all the different races of the Orient, none have shown a greater capacity for development as craftsmen under intelligent supervision and guidance, than the Filipinos. As proof of this, when Peking desired to reproduce the report of the Mukden plague conference, that required tri-color processes in illustration, the Philippine Bureau was the only plant equipped to do the work. As in other departments of activity, the native of the islands has demonstrated that capital seeking investment in Philippine enterprises, involving more or less skilled workmanship, may rely upon an adequate supply of material from which may be developed efficient workers in any trade or craft, if reasonable patience and intelligent supervision be exercised in their direction.

WORLD'S TEA TRADE

(*Continued from page 318.*)

Australia, and America. There is a growing opinion in Ceylon that at the present moment an excellent opportunity exists for establishing a good trade with the United States in natural green teas to take the place of the colored teas formerly imported from China and Japan. Ceylon has paid increasing attention to green tea the last few years (a new and well-equipped finishing factory is now being erected in Colombo), with the result that during the year under consideration 1,500,000 pounds more of it were sent from Ceylon to America than in 1909-10. Probably a good deal more green tea will be made in the island during the current year.



TEA SORTING AT FOOCHOW

SHIPPING TEA AT A FOOCHOW WAREHOUSE

The great feature of the year with regard to British-grown tea, both Indian and Ceylon, is the immense increase in direct shipments to foreign countries, particularly to Russia. Many Russian merchants who formerly made their purchases in London now buy almost entirely in Calcutta and Colombo.

Owing to the drought it is probable that the output of Natal tea will be 50,000 pounds less than in the year 1909-10—viz, 2,042,000 pounds instead of 2,092,000 pounds. The demand for this tea increases steadily. If the output were doubled the whole would probably easily be consumed in South Africa; but instead of there being any prospect of a substantial increase in the crop it seems as if, owing to the scarcity of labor, the planters would have difficulty in keeping it up to its present level. Heretofore the greater part of the work has been done by indentured labor from India, but the Indian Government last June refused to allow any more coolies to go to Natal. Labor is almost unobtainable locally, as tea can not pay the wages offered by gold and other industries. It has been suggested that men should be brought from Nyasaland, but even if that were practicable they would cost twice as much as Indian coolies.

It is estimated that there are about 20,000 acres in Nyasaland suitable for growing tea, of which about 600 are at present under tea, while there is an increasing demand for land in the vicinity of the existing gardens. Some of the land is leased by the Government at 6d. (12 cents) an acre; some sold outright at 10s. ($2.43). The aroma and flavor of the tea are said to be very good, superior to low-country Ceylon. The industry promises to be a very profitable one in Nyasaland, as labor is cheap, the natives like the work, and the tea area is within 20 miles of the Shire Highlands Railway.

Exports from China increased on the whole during the year. Shipments to the United Kingdom and Russia rose, but the United States took 23 per cent less green and 71 per cent less black tea than during the preceding year. The trade with the United States was affected by the new regulations, which came into force May 31, 1911, forbidding the importation of artificially faced or colored tea, of which until the present year about 15,000,000 pounds have been annually shipped from Shanghai to the United States.

Production in Other Countries.—The production of tea in Java increases steadily, though not rapidly, but the total output is still so small compared with that of India and Ceylon that it does not make much difference so far as satisfying the world's demand is concerned. In Java, as in most of the tea-producing countries, production is hampered by a shortage of workers, the supply of native labor not being sufficient for both rubber and tea, and the Government putting difficulties in the way of importing Chinese labor. During the year 1910-11 exports to the United Kingdom and Australia increased considerably, but less was sent to the Netherlands. The United Kingdom and the British colonies take about 40 per cent of the total amount exported.

Exports from Japan increased during the year, but not to any great extent. The quality of the leaf is not so good as it has been. Machinery is very generally used and has not yet been brought to sufficient perfection to turn out as good leaf as was formerly made by hand. When the United States passed the law forbidding the importation of colored tea a regulation was issued by the Japanese Government forbidding the manufacture or handling of such teas in Japan. As, however, Canada gave some large orders for colored teas the Government decided that the regulation should not come into force until September.

Formosa produces about 24,000,000 pounds a year. The tea is different from all other teas, being partly fermented, and therefore something between a black and a green tea. It is principally used for flavoring. The best kinds are highly valued. The first crop of this year is reported as being of exceptionally good quality.

The amount of tea grown in the Caucasus does not affect the world's supply. though the quantity is steadily increasing. The tea can be delivered in St. Petersburg at a cost of about 2s. (48 7 cents) a pound.

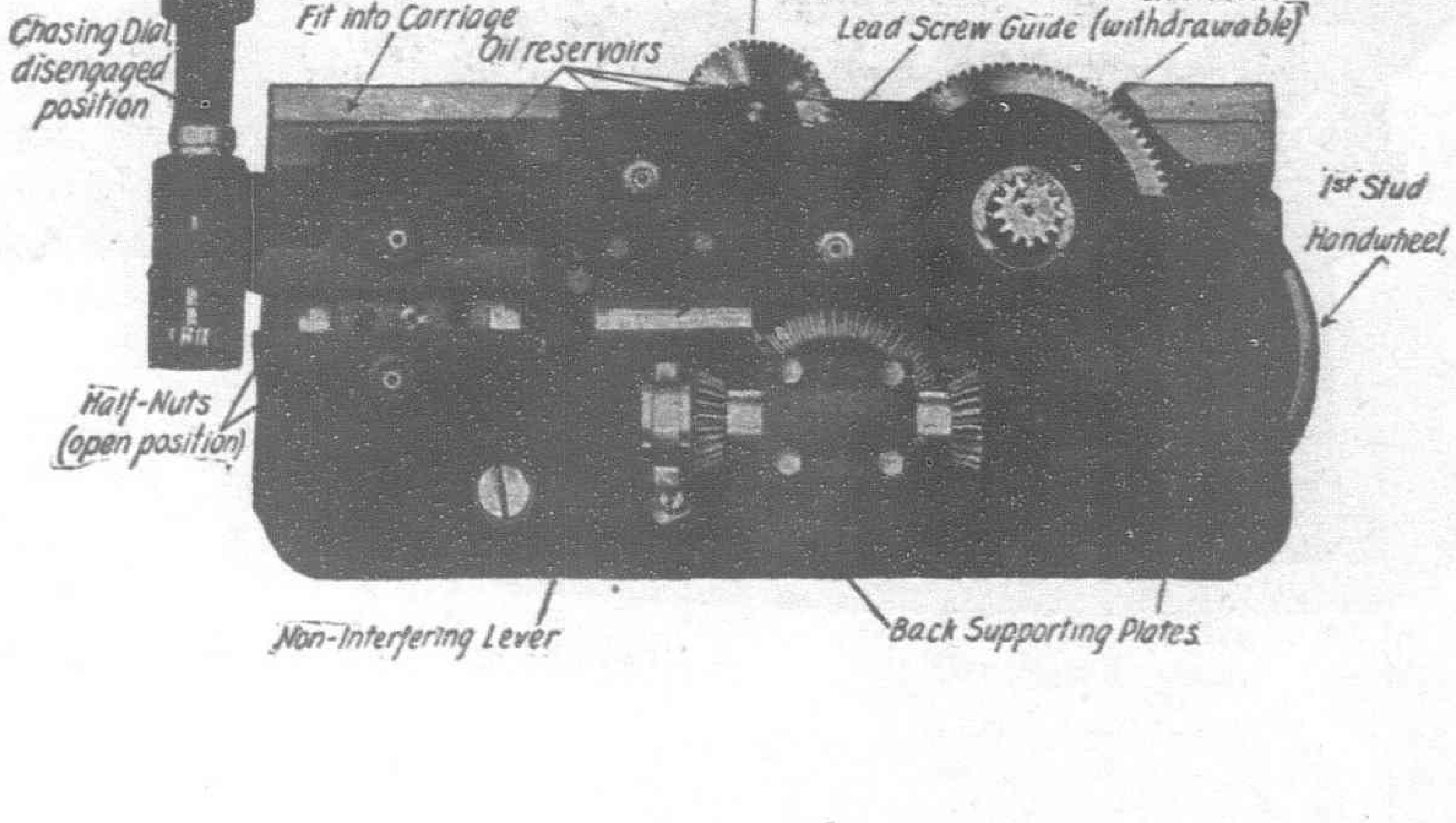
Experiments have been made for some time past in tea growing in Brazil. A sample lately received in London was of excellent quality, resembling good Ceylon. Possibly at some future time the shortage in the world's tea supply, caused by the interplanting of rubber in the old tea-producing countries of Asia, may be supplied from the rubber districts of Brazil.

The tea grown in Burma is almost entirely made into letpet (pickled tea) and eaten as a condiment. It therefore does not affect the world's supply of tea for drinking.

"AMERICAN" HIGH DUTY LATHE.

Attention is directed in a recent circular issued by the American Tool Works Company, Cincinnati, to their new "American" 24" high duty lathe, and especial reference is made to its capability of transmitting unusual power and its high quality of workmanship.

In regard to the first feature, the initial driving power is unusually high while the transmission is direct and through very few parts. A clearer conception of the power one of these new 24-inch Geared Head Lathes will develop may be gained from the fact that during a test made recently on this size machine for a representative of the Cincinnati Milling Machine Company, it removed machinery steel at the


Chasing Dial disengaged position
Supporting Ledges Fit into Carriage
Oil reservoirs
Cross Feed connection
Lead Screw Guide (withdrawable)
Rack Pinion
1st Stud
Handwheel
Half-Nuts (open position)
Non-Interfering Lever
Back Supporting Plates

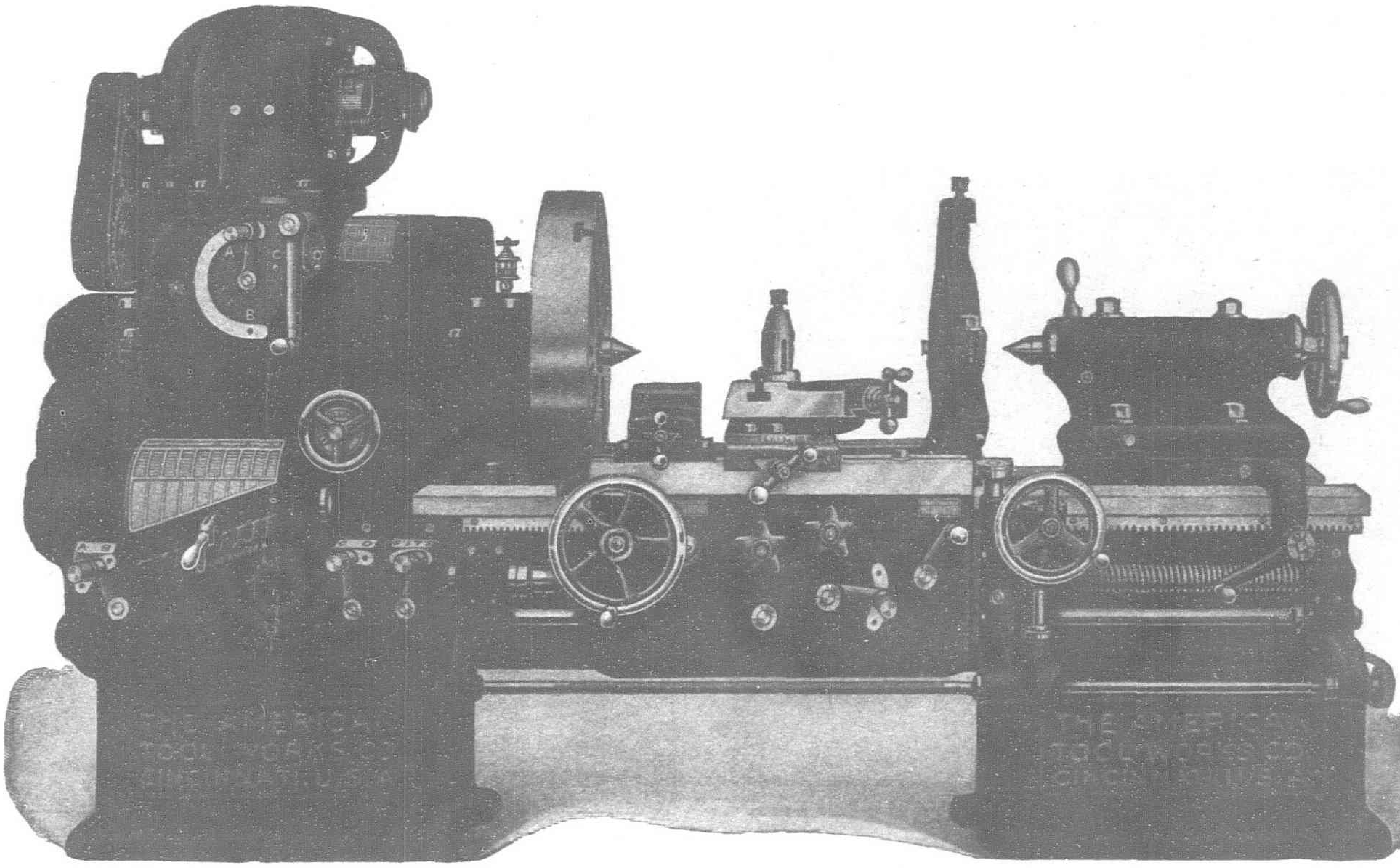
rate of 837 lbs. an hour. The following record shows the results obtained:

Diam. of work	R. P. M.	Cutting speeds	Depth of cut	Feed per revol.	Metal remover per min.	Metal removed per Hr.	Number of tools, weg.	H. P. at tool
6″	95.4	150″	¼″	⅛″	Cu.In. 55.6	837 lb.	1	17.6

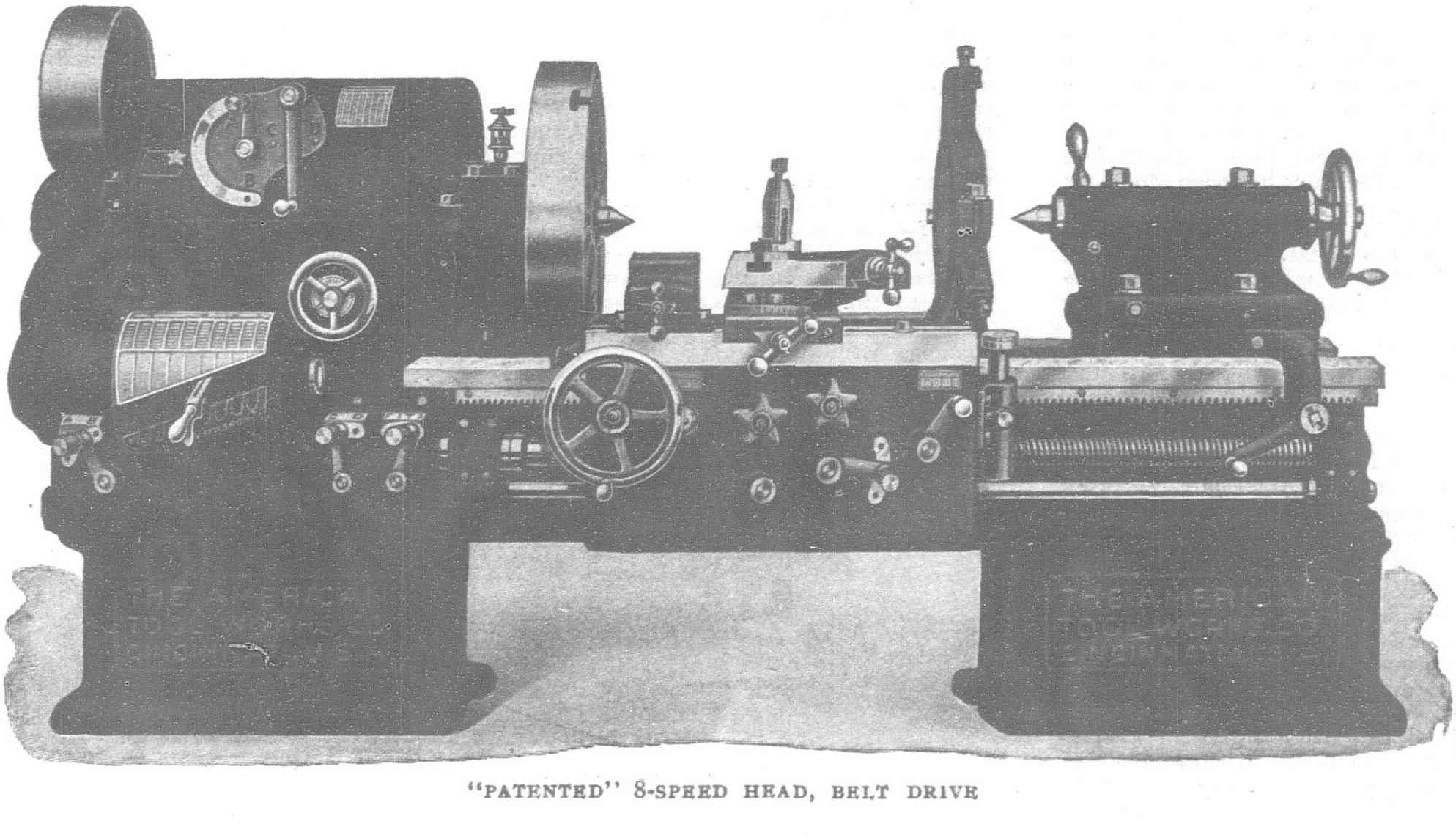
The workmanship of these lathes is of the very highest that modern equipment and experienced labor can produce. All parts of the lathe are machined to jigs, the spindle nose and face plate are chased to hardened and ground casters, the lead screw is chased from a Brown & Sharpe caster screw and all ligaments are fully guaranteed to be within .001 part of an inch.

The construction of the patented geared head, a diagram of which is shown herewith, also deserves special mention and should be especially interesting from a standpoint of excellent machine tool design.

The head affords eight spindle speeds through the medium of only twelve gears two frictions and one jaw clutch. The speeds are produced in geometrical progression and cover a wide range from 7.3 to 270 R. P. M. All gears are of unusually wide face, are cut the coarsest pitch practical with special cutters, are tested for accuracy on a special gear tester, and are mounted on short shafts which are rigidly supported, thereby eliminating all possibility of vibration or chatter which is so destructive to the gearing and consequently to the production of accurate work. The drive is direct, which in connection with the elimination of all loose running members, insures a minimum of loss through the transmission and a maximum of power delivered at the tool. The frictions used in this head afford a large areaof frictional contact, which in combination with their location on the initial driving shaft where they obtain the benefit of a constant speed which is exceptionally fast due to the unusually high head ratio-insures an ample transmission of power with, out slippage. The lubricating system of this

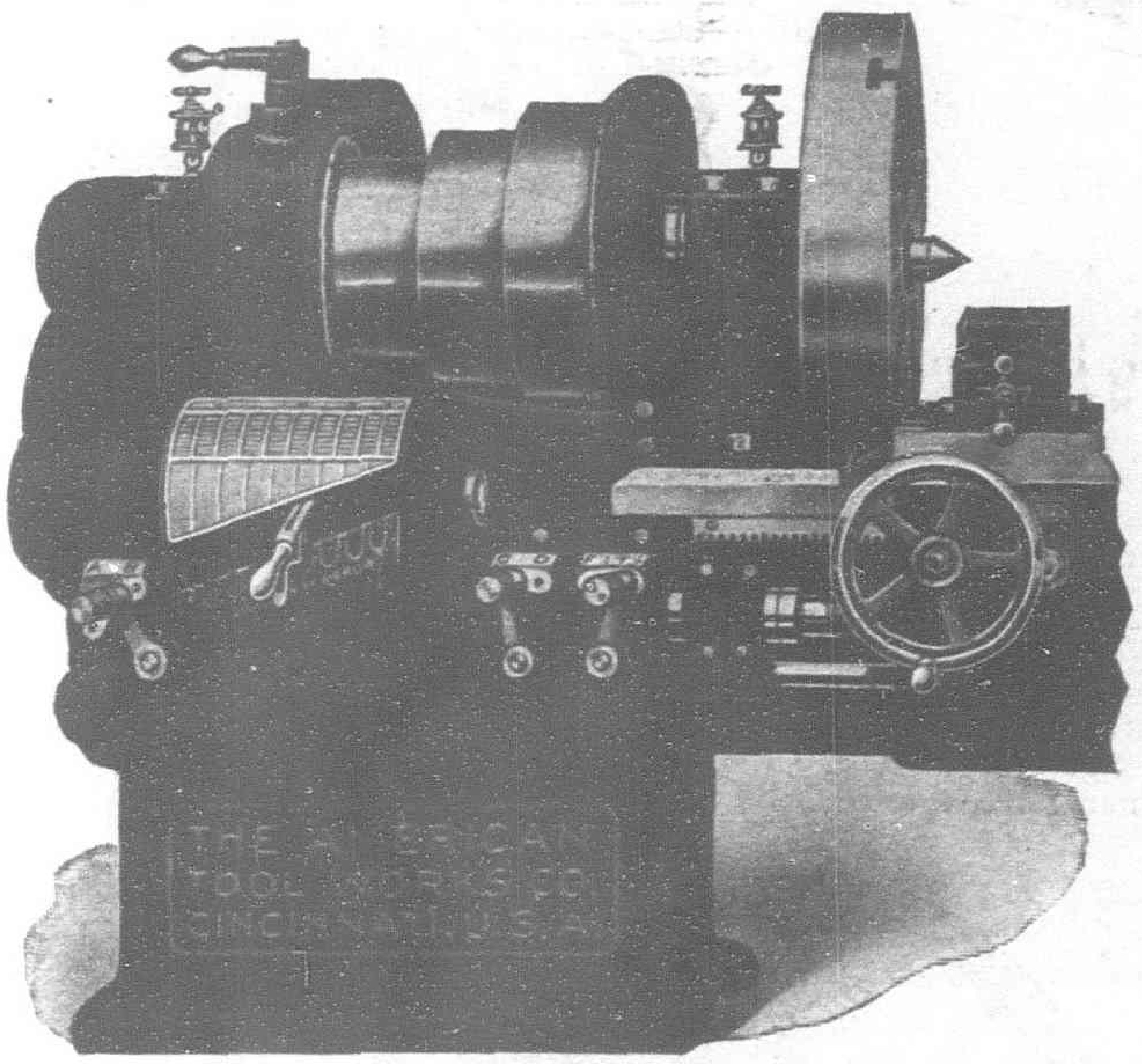


MOTOR DRIVEN THRU "PATENTED" 8-SPEED HEAD

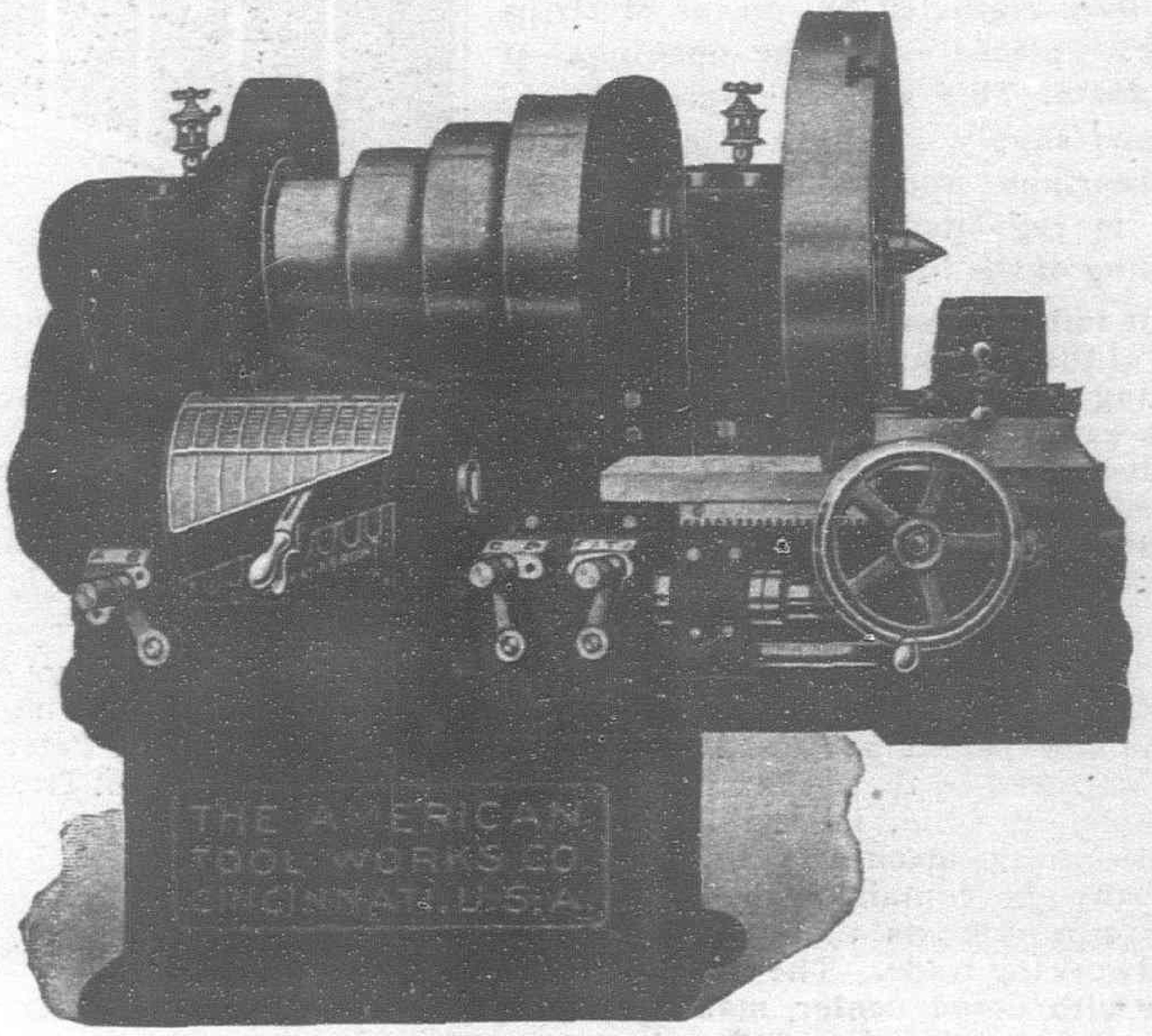


"PATENTED" 8-SPEED HEAD, BELT DRIVE

head has been carefully worked out. The spindle bearings are supplied with eight feed oilers, while the other bearings are bronze bushed, the bushings being so constructed as to form a recess for retaining the oil which is supplied through oil pipes from the outside of the head and which is fed to the bearing by means of a strip of felt inserted in a slot cut in the bushing. This strip of felt filters the oil and distributes it uniformly over the entire bearing, and at the same time prevents the lubricant from running out of the bearing and being wasted.



3-STEP CONE, DOUBLE BACK GEARED HEAD



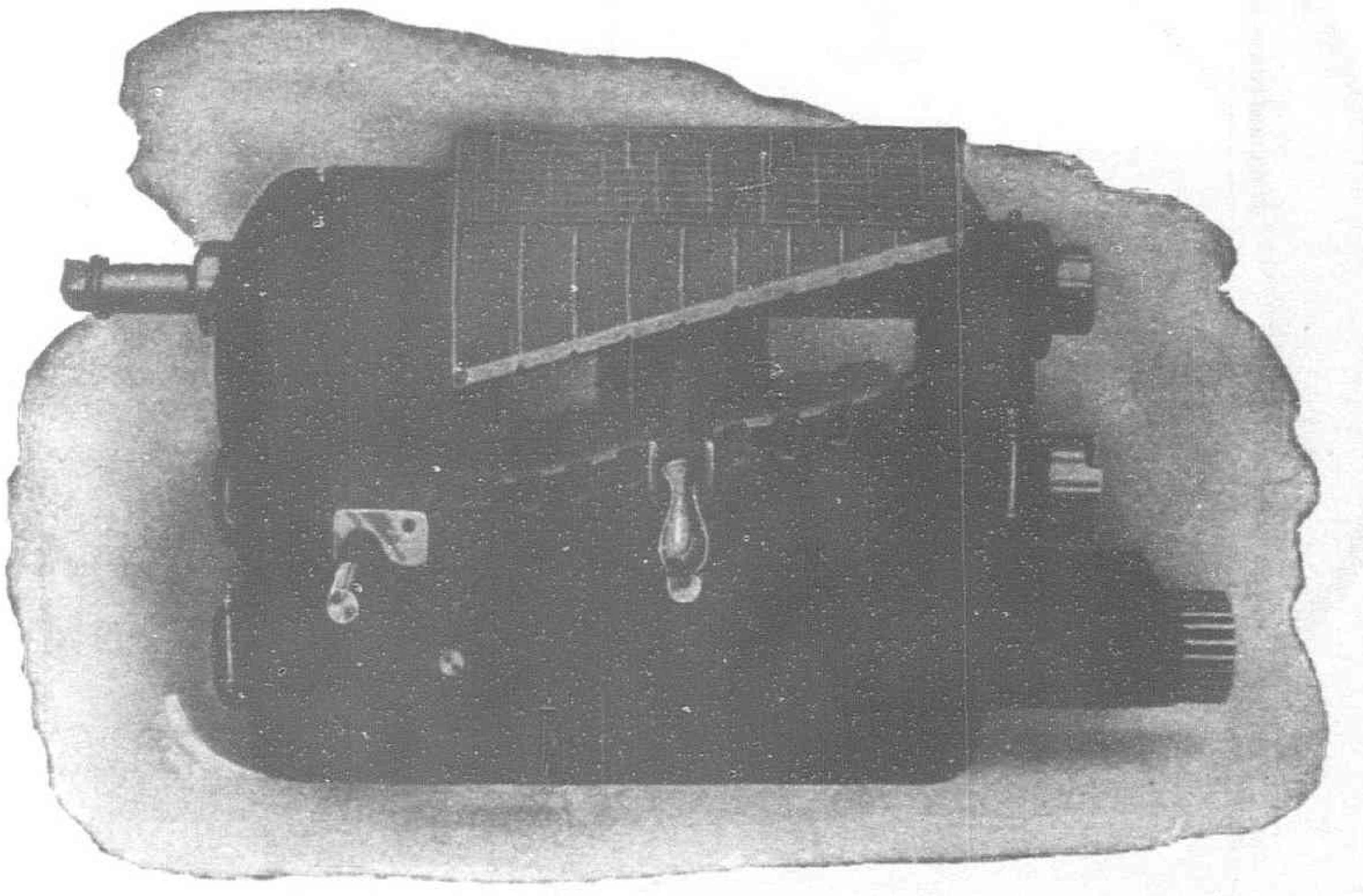
4-STEP CONE, SINGLE BACK GEARED HEAD

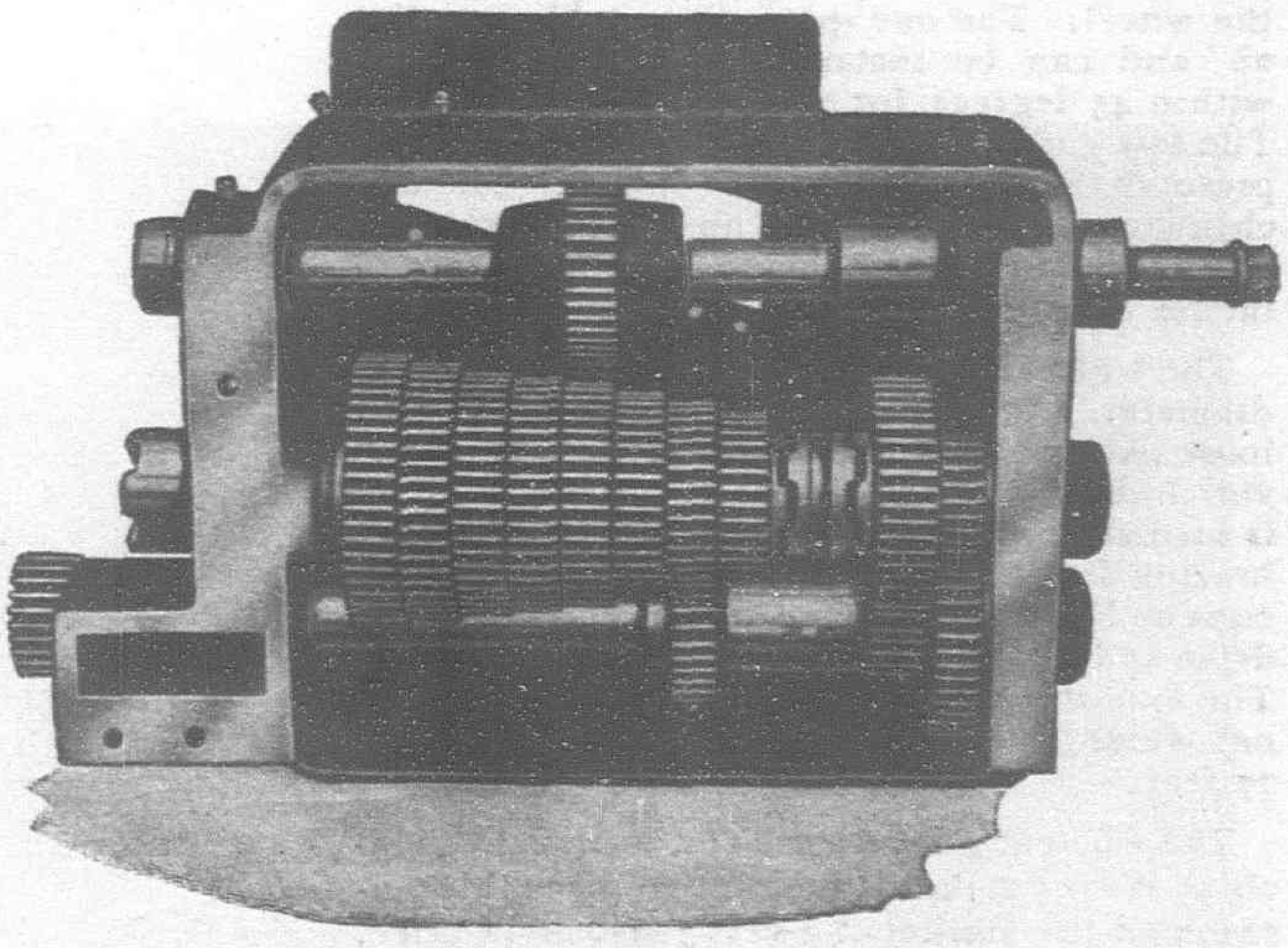
The driving pulley runs on a bronze bushed steel sleeve which relieves the initial driving shaft of all belt strain. The pulley is of very large diameter and wide face and presents an unusually large surface for belt contact. Lubrication is effected by means of a circulating oiling system which insures a continuous supply of oil to the bearings. This system has been used for many years on "American" lathes and has been, in every case, highly satisfactory.

Of all the new features incorporated in this lathe, one of the most highly developed and the one which presents the most radial change in design from other similar mechanisms, is the thread cutting and feeding mechanism. It is of the cone and tumbler type, and embodies only seventeen gears and three levers, and produces forty-eight changes for threading and feeding. (See detail illustration of feed mechanism and cut of index plate.) The cone and tumbler gears are cut from high grade steel castings with twenty degree involute Brown & Sharpe cutters which produce a tooth of unusual strength, and one which is pointed at the top.

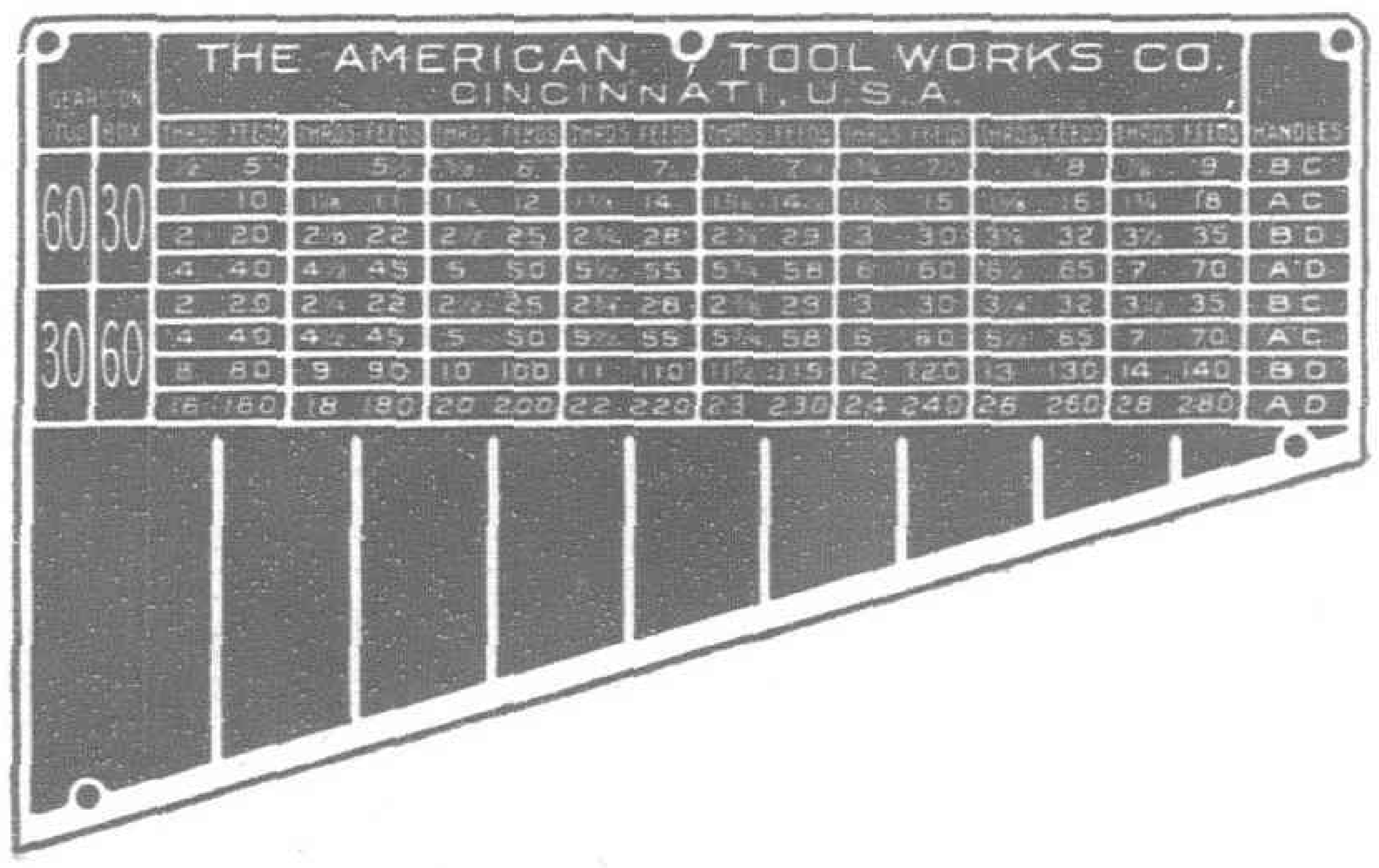
The advantage of this type of tooth over the 14 degree tooth generally used lies in the fact that the pointed tooth is much more easily engaged, due to its pointed construction and eliminates the riding of the gears on top of one another before dropping into mesh as often occurs where the 14 degree tooth is used.

The one feature, however, which is of decided value and which distinguishes this mechanism from all others is the *non-speeding up feature* which enables the power to be transmitted direct through the cone for cutting the coarse threads and feeds, and thus eliminates the necessity of speeding up this mechanism by compound gearing to obtain sufficient speed to the lead screw to cut the coarse threads. The advantage of this is that in cutting the coarse threads when the greatest power is required, the drive is direct and consequently a minimum of power is lost in transmission. In practically every other design it is necessary to speed up by compounding in the box to obtain sufficient speed for the coarse threads. This design also avoids a complicated mechanism with its consequent annoyances. A quadrant construction is furnished on the end of bed by means of which this lathe is given a practically unlimited range for feeding and screw cutting. In order to obtain any thread or feed not listed on the index plate, it is only necessary to figure out the correct gear combination to produce the desired thread and then add the gear or gears to the quadrant. The engineering department of the Company is always at the service of its customers. The index plate showing the different combinations for obtaining the thread and feed is located on the box directly over the tumbler lever and is direct reading. See illustration. Another feature in connection with this quick change mechanism is that the lead screw and feed rod operate independently, the lead screw being used only for chasing threads while the feed rod is used for all feeding purposes. When the feed rod is in operation the lead screw is at rest, and vice versa.



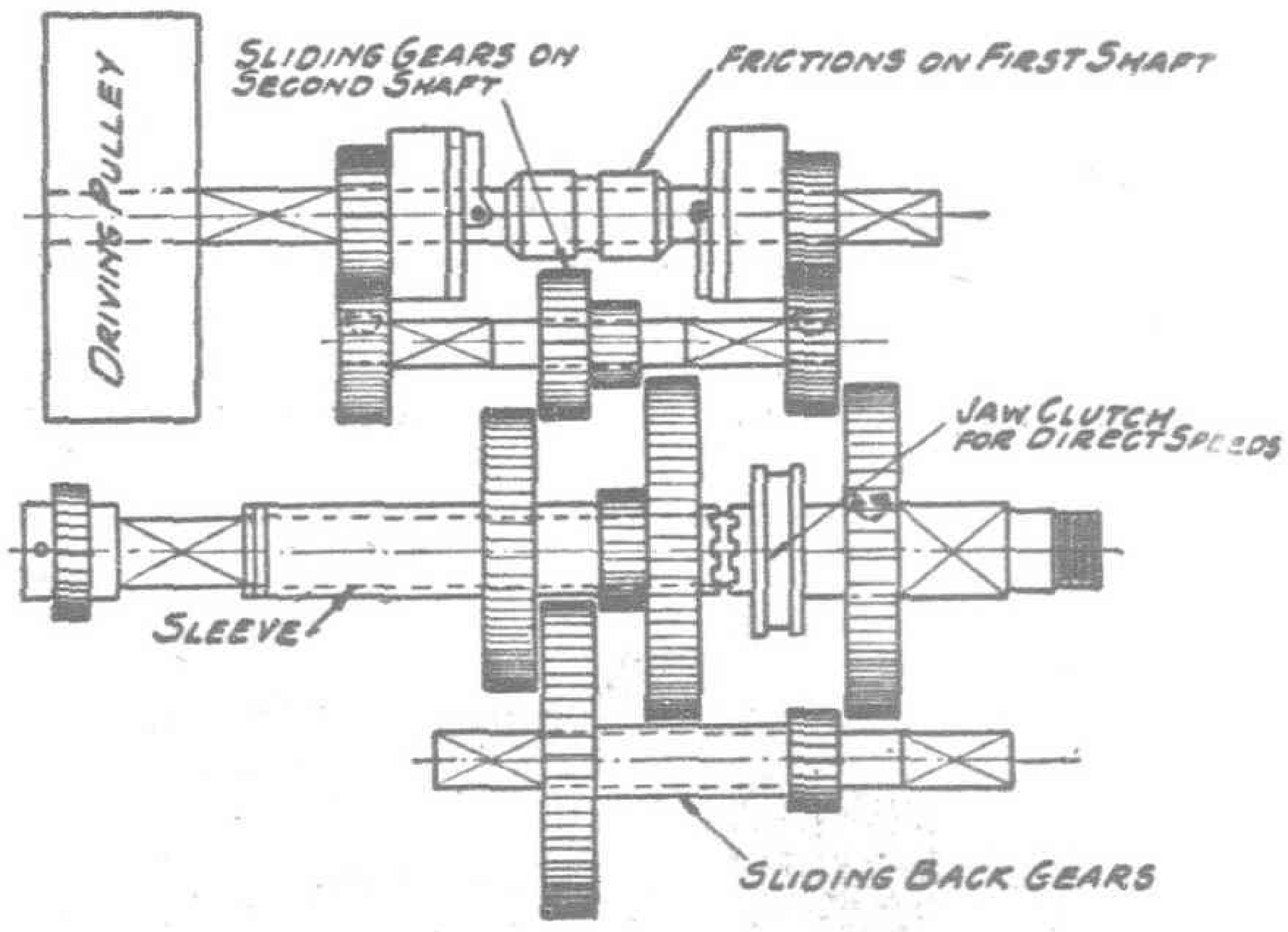


The new High Duty Apron is also of improved design. As evidenced by the accompanying illustration it is of double plate construction which forms an outer support for all studs even including the cross feed stud. The design is exceptionally simple and convenient. All superfluous parts have been eliminated, thereby forming as direct a drive as is possible to obtain in order to produce the desired results. All gears in this mechanism are steel while all studs are hardened and ground to size. A noninterfering plate is furnished which is absolutely certain in its action end prevents the lead screw and feed rod from being engaged at the same time. The oiling of this apron has been made a feature. As is shown by the apron illustrations, the oil is introduced from the outside of the apron and by means of pipes is led to reservoirs formed in the back plate of the apron which contain a large supply of the lubricant. The oil is then fed to the different bearings by means of oil ducts, the oil being filtered and the flow regulated by means of strips of felt placed over the openings of the ducts. This system insures a continuous supply of fresh, clean oil to the bearings, and avoids waste as the flow is regulated and thus prevents flooding of the bearings.



THE AMERICAN TOOL WORKS CO.
CINCINNATI, U.S.A.

GEAR ON STUD	GEAR ON BOX	THRDS	FEEDS	THRDS	FEEDS	THRDS	FEEDS	THRDS	FEEDS	THRDS	FEEDS	THRDS	FEEDS	THRDS	FEEDS	THRDS	FEEDS	HANDLES
60	30	½	5	[illegible]	5½	[illegible]	6	[illegible]	7	[illegible]	7	¾	7½	[illegible]	8	[illegible]	9	B C
		1	10	1⅛	11	1¼	12	[illegible]	14	[illegible]	14½	[illegible]	15	[illegible]	16	1¾	18	A C
		2	20	2¼	22	2½	25	2¾	28	[illegible]	29	3	30	3¼	32	3½	35	B D
		4	40	4½	45	5	50	5½	55	5¾	58	6	60	6½	65	7	70	A D
30	60	2	20	2¼	22	2½	25	2¾	28	[illegible]	29	3	30	3¼	32	3½	35	B C
		4	40	4½	45	5	50	5½	55	5¾	58	6	60	6½	65	7	70	A C
		8	80	9	90	10	100	11	110	11½	115	12	120	13	130	14	140	B D
		16	160	18	180	20	200	22	220	23	230	24	240	26	260	28	280	A D



The tailstock has been made unusually rigid. It is of the four belt type, the back belts extending to the top of the barrel while the front belts extend only a trifle above the base of the tailstock. This construction makes it very convenient for the operator when clamping the tailstock to the bed. The rigidity of the tailstock is further increased by being supplied with a poll which is dropped into a rack cast through the center of the bed. The *tailstock barrel is solid* and is applied with an improved form of plug binder for clamping the spindle.

The bronze used on this lathe is of the very best grade obtainable for the purpose, being made up especially from the company's own formula.

These new lathes are claimed to be the highest examples of scientific and practical machine tool design that have ever been put on the market and that their excellence of design in connection with their superior workmanship produce the most magnificent machine of this type that has ever been built.

THE DEFIANCE MACHINE WORKS

The new patent 28″ hand sawing machine manufactured by the Defiance Machine Works of Defiance, Ohio, is the latest product in woodworking machinery of this enterprising company and contains many patented features and improvements that must appeal to the woodworking trade. The frame is cast in one piece with cored center, making it very stiff and reliable with a broad floor base to sustain it firmly. The wheels are 28″ in diameter, 1½″ face covered with pure rubber bands, ground true after fitting the wheels and given a running balance. They are supported upon ground steel spindles of large diameter running in long bronze self-lubricating bearings of the reservoir system. The upper wheel is provided with screened safety guard and the lower one is covered with a solid iron disc to protect the operator.

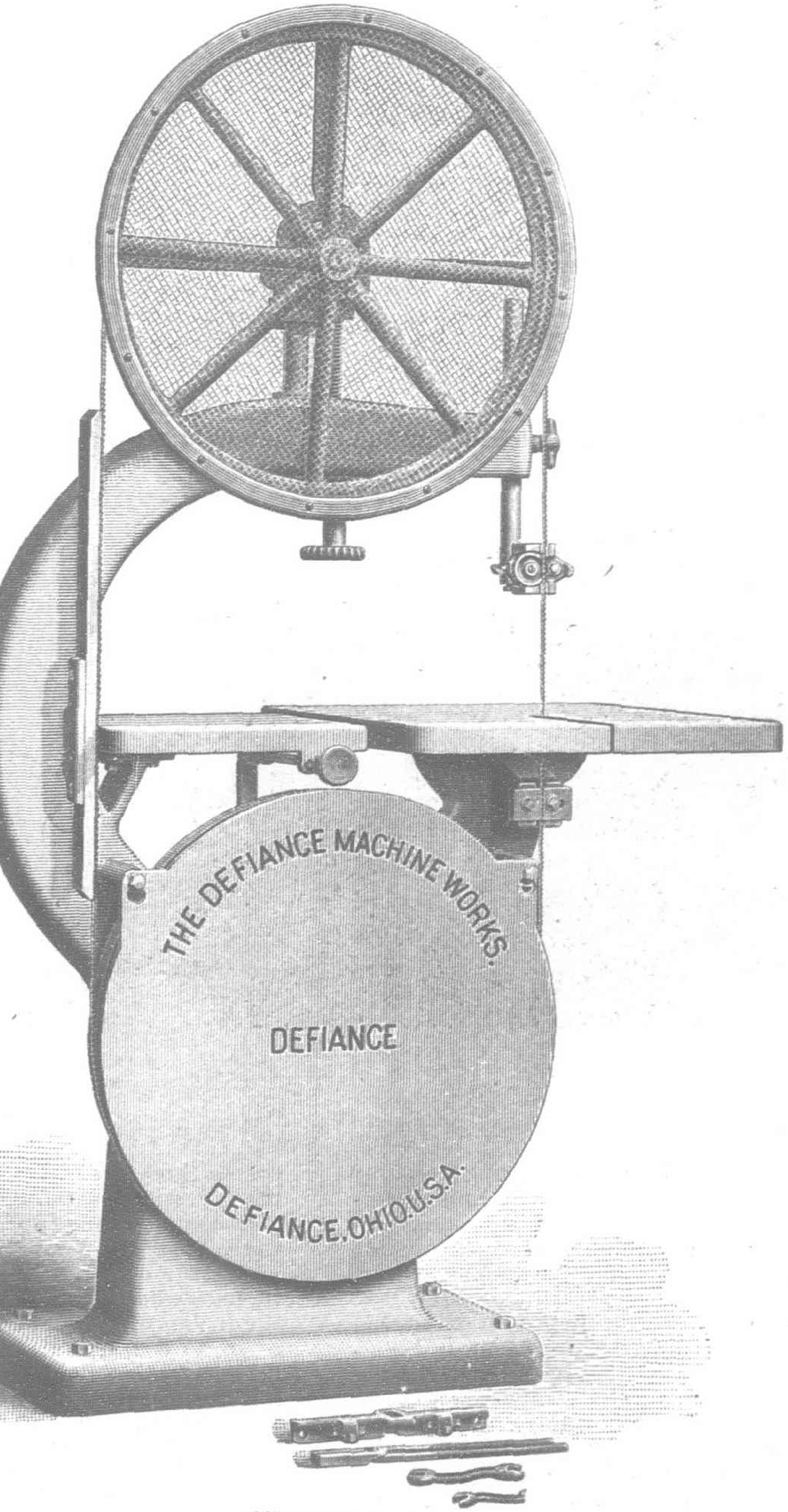
The tension device is ingenious. It maintains automatically a uniform tension to the saw blade, so that light or heavy sawing in hard or soft wood can be accomplished without fear of the saw blade breaking or running off the wheel. The one piece iron table is 24″ × 28″ and can be instantly tilted to any angle within 45 degrees for conical or bevel sawing. The saw guides are of the non-friction type and preserve the saw from heat or injury. The machine can take material up to 12 inches in thickness and the saw blade used is 14 feet 10 inches long.

The tight and loose pulleys are 10 inches in diameter, 4 inch face, speed 700 r. p. m. with loose pulley constructed with self-oiling reservoir hub and bronze bearings. Each machine is furnished with one 3-8 inch band saw blade, brazing tongs and vice, and the necessary oil cups and wrenches. One h. p. represents the drive and the floor space occupied is 34″ × 26″. The export shipping weight is 1,200 pounds, net weight 800 pounds, and cubic measurement 77 feet.

The efficiency developed at the Defiance Machine Works makes it possible to place this machine on the market at a very reasonable price. It is built by automatic machines operated by highly skilled workmen. It is found a very desirable saw for piano and organ factories, pattern work, and woodworking generally.

The Defiance Machine Works have started the construction of new extensions to their now large plant. This will include a saw tooth erecting shop, 132′ × 77′ and on the west side a saw tooth building 115′ × 97′ will be erected and will include the casting and cleaning department, shafting and bar steel store house, plate shop, plate warehouse, and blacksmith shop. Many new modern devices will be added to the equipment to maintain the highest possible efficiency of any machine shop in the United States.

The *Defiance Express* announces the election of the following officers for the current year: President, Peter Kettenring; Secretary, W. R. Strickland; Tresurer and General Manager, C. H. Kettenring. R. Carey May will act as assistant secretary and C. H. Hoffman as assistant treasurer. The new board of directors is composed of the following gentlemen: Peter Ketten-


THE DEFIANCE MACHINE WORKS.
DEFIANCE
DEFIANCE, OHIO, U.S.A.

28″ BAND SAW

BATTERY TRUCK CRANE

A device for handling, with expedition and at a low cost, freight and materials, loose or in packages, which have to be lifted and moved through moderate distances, has been urgently needed, not only at the great railway and marine terminals, but also in manufacturing plants and many other places. To meet this demand the General Electric Company, Schenectady, N. Y., is now placing on the market the Battery Truck Crane, an electric vehicle which has a swinging crane mounted on the front end. The crane's hook is raised and lowered by a one-ton hoist mounted on the front end just back of the crane, the motors driving the hoist and the vehicle being operated from a battery mounted on the rear end. The time, money, and step saving applications of this crane may be classed under three heads: hoisting, hoisting and carrying on the hook, and towing trailers, yet a given movement of material may involve one, two, or all of these.

Hoisting.—In case where material, which may be subdived into parcels of one ton or less, has to be deposited within a 6 or 8 foot radius and this action does not require that the parcel be moved through a vertical distance of over 10 feet, the machine is brought into an advantageous position, the brakes are set, and the vehicle remains stationary as the boom of the crane moved back and forth between the picking up and depositing points.

In this manner the Battery Truck Crane may be employed to load or unload box cars, gondola cars, wagons, power trucks, trailers, lighters, etc., and effects a saving both in time required and number of men employed.

Some illustrations of the effective employment of this machine are as follows:

300 castings, aggregating 65000 lbs., were unloaded from a gondola car in 5 hours, giving an average of 1.2 lifts per minute. A box car was loaded with sixty-four 800 lbs. bbls. of plumbago in 25 minutes and 4 cars loaded in 2½-hours, the latter work including spotting the cars. This averages two bbls. per minute hoisted nearly 5 feet and swung well inside the cars.

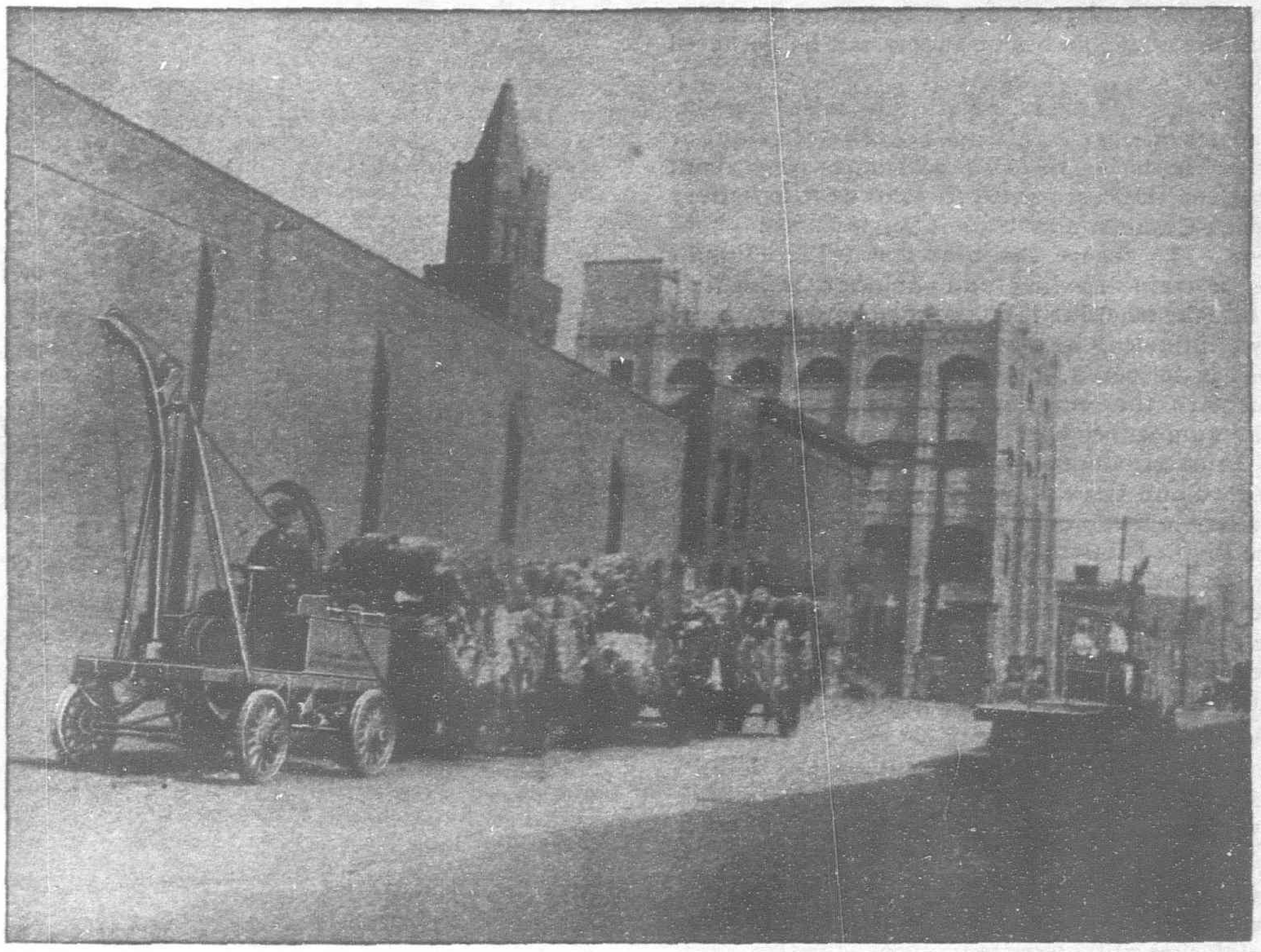
Hoisting and Carrying on the Hook.—When material, in small or large quantities, has to be moved less than 400 feet or, in small quantities, to any distance, the article is lifted by the hook, conveyed to its destination by the vehicle, and placed on the floor, on a rack, or a high pile, as desired.

The short wheel base permits making short turns so this machine may readily be driven about shop aisles, congested piers, or among the piles of material in a storage yard.

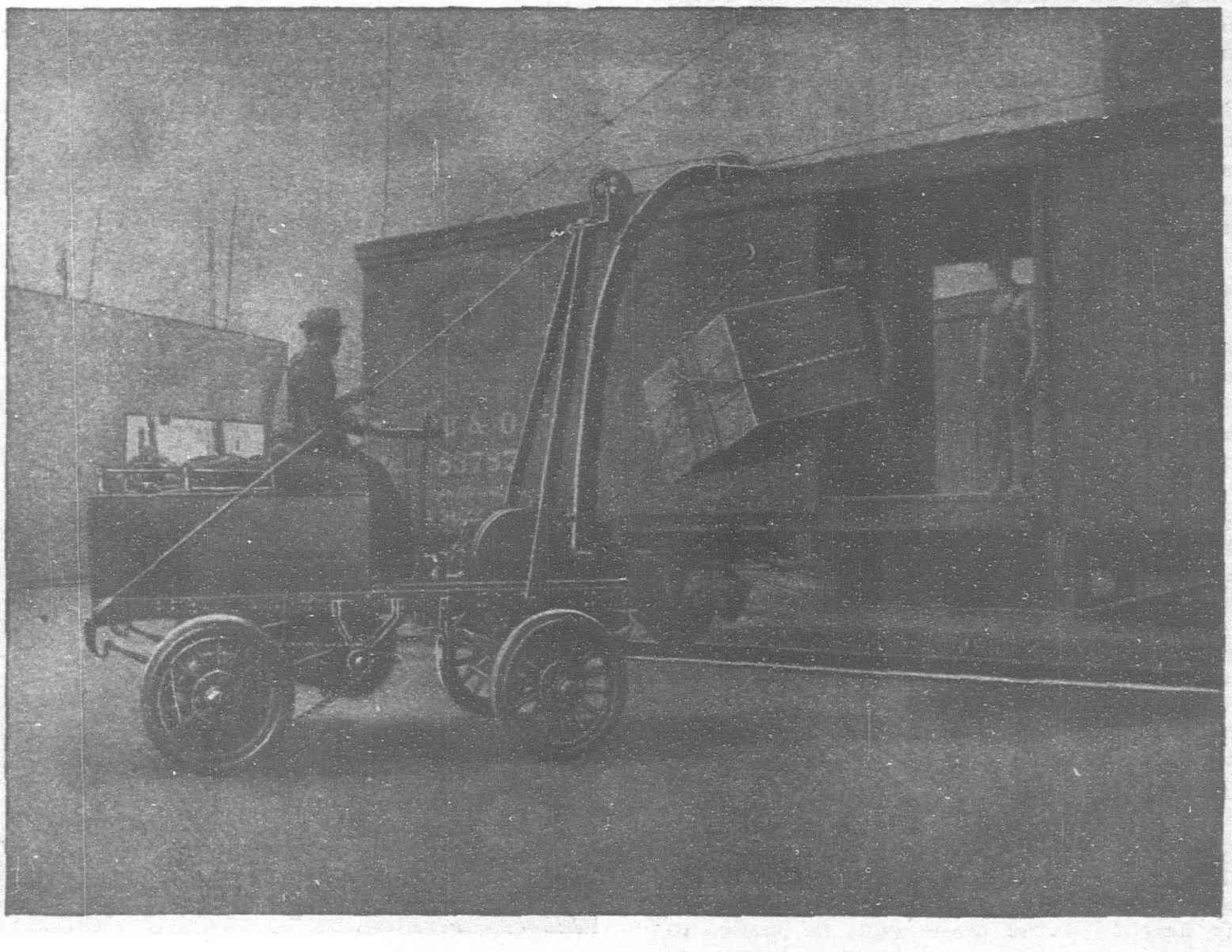
The flexibility of operation, simplicity, and speed of this machine admirably adapt it to heavy errand work about factories even when they are fully equipped with cranes and an industrial railway. Derailed cars and spilled loads on the industrial railway are quickly replaced and the line cleared by the Battery Truck Crane.

By this pick-up-and-run method sixty 800 lbs. barrels of plumbago were moved 300 feet in one hour, one helper only being required. One hundred and fifty 300 lbs. boxes of rubber were conveyed 75 ft. and loaded into a box car in 5 minutes, three boxes being slung together and a round trip made every minute. In a store room, boxes of angle and flat iron weighing about 1000 lbs. each were carried 20 feet and stacked in sorted and orderly piles at the rate of 40 boxes an hour. One ten rocks were loaded onto trailers from a scattering pile at the rate of 24 an hour, being hoisted 2 feet and carried about 20 feet in the operation. Two 1200 lb. water meters were lifted from a hole 6 feet deep and carried to the shop bench a thousand feet away in 30 minutes.

These illustrations show the remarkable economy gained by employing this machine in place



A TYPICAL SCENE AT THE BUSH TERMINAL, NEW YORK



BATTERY TRUCK CRANE LOADING BOX CAR

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ring, R. P. Kettenring, W. R. Strickland, George A. Ensign, C. C Hoffman, and R. Carey May. The new secretary, Mr. W. R. Strickland, is familiar with the export trade having been connected with Messrs. Strong & Trowbridge, 17 Battery Place, New York, one of the foremost export houses in the country, during which time he had much to do with the export of the product of the Defiance Machine Works, and may be expected to devote increased attention to the firm's foreign trade expansion.

of the usual gin-poles, tackle, planks, rollers, levers, etc., for the truck will do the work before the above mentioned tools can be gathered together.

Towing Trailers.—For the miscellaneou transfer of large quantities of package freight or other material through a distance over about 400 feet the best procedure is to use the Battery Truck Crane to tow trailers in trains of about four. To secure the best results there should be a train loading and another unloading while the machine is on the road between, thereby eliminating any waiting, for, as soon as the load is delivered, the vehicle immediately starts out with the empties from the previous trip. The number of trailers per train and the number of trains will depend upon the distance, character of load and time taken to load and unload the trailers. Twelve is the usual number and these are divided into three trains. Thus the Battery Truck Crane keeps 600 sq. ft. of loading deck working to its maximum capacity. This would be equal to a single vehicle 5 feet wide by 120 feet long, or to twelve individual power operated trucks, each having 50 square feet of space for carrying material.

The following represents an average week's work at towing trailers in the Bush Terminal New York, deduced from the logs of a number of these machines operating over a long period:

Number of packages handled	7570
Average weight per package	230 lbs.
Total weight handled (900 tons) 1,720,000 ,,	
Average distance packages were moved	900 ft.
Per cent of total time machine was working	80%
Packages delivered per working minute	3
Number of different jobs worked on	30
Heaviest single load drawn	12-½ tons.
Cost of operator, interest, depreciation, power	$24.00
Cost of moving one package 900 ft.	⅓c
,, ,, ,, ,, ton (9 packages) 900 ft	3c

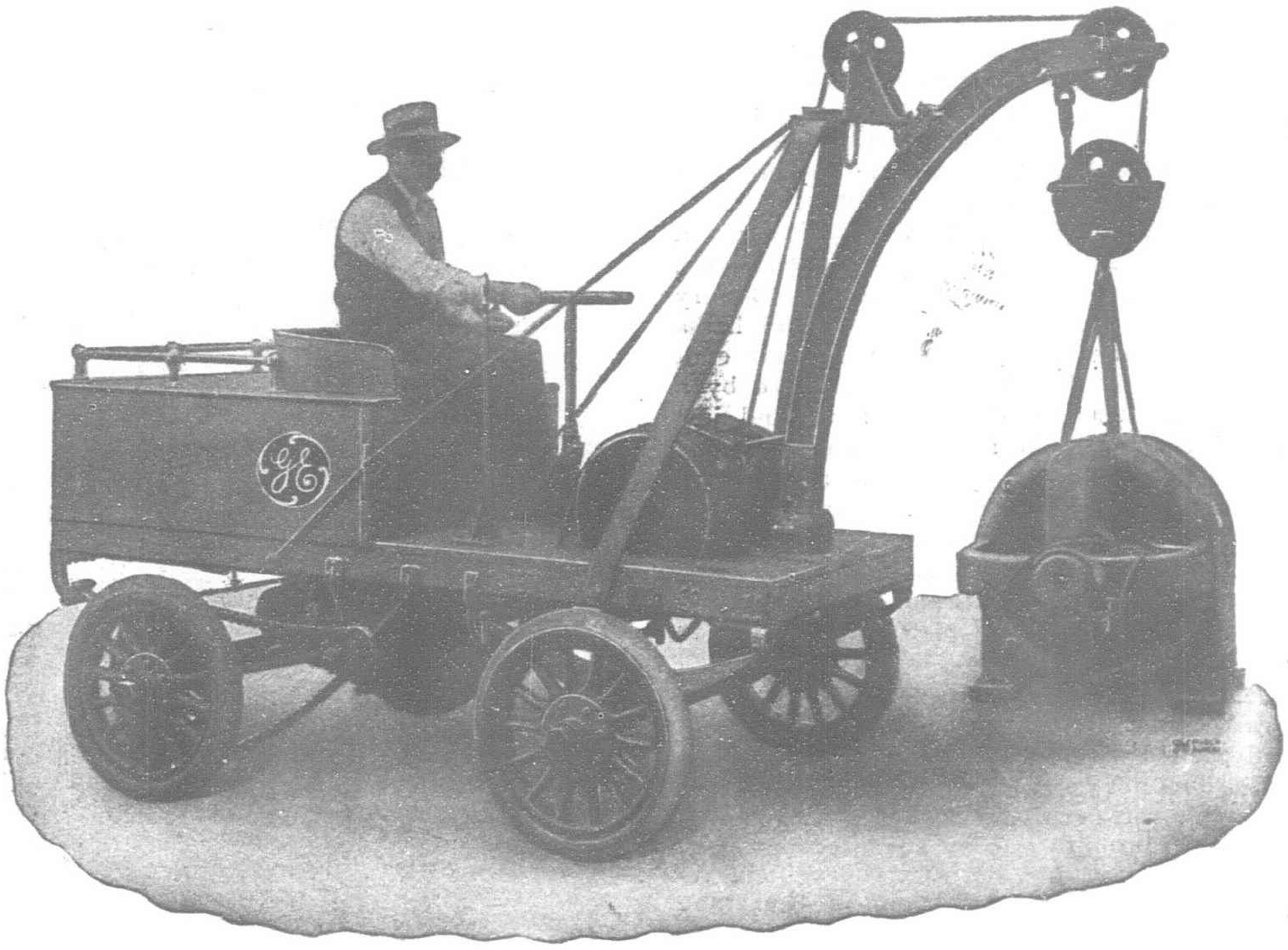
600,000 lbs. of cotton have been moved ½ mile in a day (10 hrs.) taking 24 bales per load and making a round trip every 12 minutes. This gives an average of 2 bales (500 lbs. each) per minute moved a distance of one-half mile. On a hurry order for cotton, 48 bales (12 tons) were delivered alongside the lighter within 25 minutes after the order was given. One Battery Truck Crane using three trailer-trains of two cars each, has moved 1,000,000 lbs. of small package freight (canned salmon) 600 feet in nineteen hours.

The Battery Truck Crane is designed for a high draw bar pull, its maximum being a pull of 2000 lbs. and equal to that of a 5-ton locomotive on rails and sufficient to spot a car, pull wagons or automobiles out of mud holes, and to readily handle loads of from 5 to 8 tons on trailers.

Trailers of special design, having a capacity of 3 tons, are employed in this work. The wheels are 24" in diameter by 5" face and have roller bearings. The deck is 12 feet long × 4 feet wide and is 29" from the ground. The heavy towing tongue readily couples to the vehicle or to another trailer and no trouble is experienced in towing a large number around obstructions, as they follow perfectly in the course of the battery truck crane.

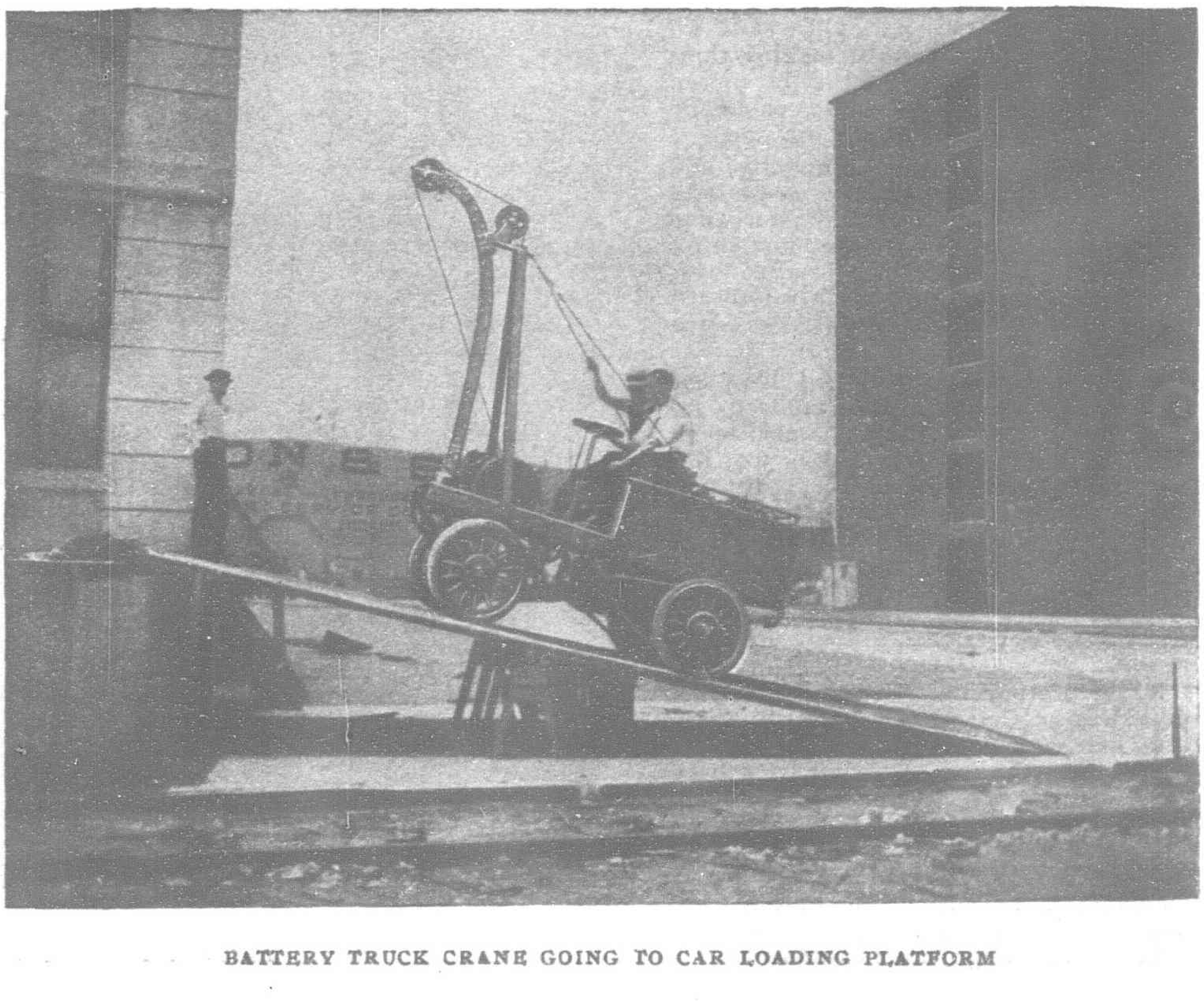
The crane is equipped with special attachments to suit the character of the work contemplated. These consist of rope and chain slings, barrel tongs, bale grapples, box hook, snatch blocks, and small tools.

For very special work other equipments are designed and built to meet the requirements. The height of the crane can be made to suit local conditions, or several booms of different lengths can be supplied. The trailers may also be modified to suit elevators or other limiting features.



BATTERY TRUCK CRANE CARRYING LOAD ON HOOK

The Battery Truck Crane has all the advantages of an electrically operated vehicle, being odorless, noiseless, and characterized by freedom from explosion or fire hazard. The simplicity of operating mechanism eliminates the need of experts, as a man of ordinary intelligence can become fairly proficient in operation in a day and expert in a few weeks. The battery charging may be left to a night watchman. Where direct current is available, a simple panel and rheostat serves for the charging apparatus, while, if alternating current is used, a rectifier panel will transform the current to D. C. for changing.



BATTERY TRUCK CRANE GOING TO CAR LOADING PLATFORM

* AMERICA'S EXPORT TRADE

When I accepted the courteous invitation of your secretary to address your association, it was with the thought of a conference with fellow manufacturers on subjects of mutual concern. The matter has, however, so developed that I find myself speaking before a body of recognized experts. I can not claim any peculiar knowledge or experience that would warrant my thinking of enlightening or informing you, and therefore the most I can hope is to formulate some thoughts that manufacturers who seek export trade have in common, and through you perhaps suggest to others some ideas that with your approval may be helpful.

The leading factors in the world's markets.—In the world's markets there are three great competitors—England, Germany, and the United States. There are, of course, others who enter these markets, as France and Belgium, and so forth, but the three countries named are the leading industrial ones and their competition especially interests us. I do not minimize the position of France, with her great wealth and the exceptional skill and artistic taste of her people, but her position is individual and rather separate from that of the three great competitors.

The position of Great Britain in export trade.—Let us examine briefly these three. Great Britain has in her favor vast free capital which, with her primacy in the merchant fleet of the world and the material resources of her great Empire, has given her a dominating position. Her manufacturers sell in large part in markets controlled by their own power and have at their disposal a world-wide shipping and an equally widespread and strong banking system. In some parts of her Empire preferential duties exist in her favor, with cheap postage and the control of telegraph lines throughout the world. From this hasty sketch we must not omit the courage and strength of the English character, nor the exceptional record of her great houses for honor and strength, nor almost 200 years of industrial and commercial experience.

Germany and her export trade.—The great foreign trade of Germany is of recent growth. It is backed by an almost perfect commercial organization and by the exceptional German talent for thoroughness and research. Doubtless German foreign commerce is based upon more thorough and scientific knowledge and study and preparation than that of any other people. She, too, places at the support of her exporters a widespread merchant shipping and world-wide banking power.

America as an exporting nation.—The United States is the youngest competitor of the three, so far as relates to the world's markets. One need not go back far to find the time when our export trade in manufactures was negligible. We have not yet the enormous free wealth of Great Britain, we lack the scientific organization of Germany, we are without foreign shipping and almost without foreign banks. We have, however, as one great resource the peculiar initiative of the American, his inventiveness, that spirit which makes the progress in your shops so rapid that six months ago with many of you is ancient history, that alertness, that mechanical imagination which reaches many a result long before the German by research has sought it out or the Englishman has contemplated a change.

Comparative features of English and German export trade.—Let us go a bit deeper in our analysis. Great Britain must export or die industrially. Perhaps 90 per cent of all she manufactures is and must be sold abroad. She has not the domestic means of consumption. Therefore, the outlook of the English manufacturer is a world-wide one. From his earliest start at industry he has thought of things abroad. A factory in his country whose market is chiefly at home is relatively rare. By every instinct and training he is an exporter, and the great system that backs him up has grown out of the necessity of his case and the political power of his Empire responds to and fills the need.

In Germany a rapidly growing population in a country that can not expand in area and which has, on the whole, limited natural resources must expand commercially or must commercially die. The German people alone can not absorb the product of the highly trained German mind and hand. The German has a peculiar genius for organization, and seeing his great competitor, Great Britain, established throughout the world he has by organization and study developed that which she lacks and has become a serious and a menacing competitor with her. The German manufacturer may, because of the larger population of his land, find a larger home market than Great Britain, but it is true of him also, though in lesser degree than with his English rival, that he must export the larger part of his product; hence he, too, finds his outlook into the world's markets a normal one.

The evolution of American export trade.—Here in America the reverse is true. For a century or more we have been developing our industries with a proper and sole regard to our domestic needs. The markets of America have grown so fast, both in quantity and quality of their demands, that our industries have till recently had much to do to keep them supplied; but of late years a change has come. Our industries have so grown that their output when run continuously at full time is greater than our home market will take at its best, and when times are dull here there is a large surplus of unsold goods. Out of this has grown first the wish for and then the need to obtain foreign markets. Out of this same background has grown the peculiar outlook of the American manufacturer upon the foreign field. To him it is not or has not been the chief market he seeks, but rather an incidental one. His output has been meant for home consumption first and secondarily for sale abroad, and it is as yet only in exceptional cases that he has come to realize the great value of the foreign markets to him and to know that they may be as valuable a part of his permanent field as are his customers at home.

Therefore, we American manufacturers enter the foreign campaign with certain handicaps. Our competitors regard the foreign markets as their primary work, we as our secondary work. They must have them to survive. We want them to add to a market already very large. They strain every nerve, commercial and governmental, to secure and maintain them. We have nothing but private initiative, the alertness of mind of our manufacturers, and our peculiar inventive genius and restless energy upon which to depend. Yet despite these handicaps we have become a mighty factor in the foreign field, until now out of our total exports manufactured products are 45 per cent, and the great mass of agricultural products, for which for many years we have been famous throughout the world, has fallen to a subordinate place as compared with our foreign sales of manufactures. The day when American manufacturers could not compete on even terms with the producers of Europe has largely passed, and our opportunities are enlarging as our outlook broadens.

This brief and inadequate sketch of the broad conditions affecting our export trade leads naturally to the question how we shall add to that we have already won. It has been found that our peculiar capacity for making and using mechanical devices and labor-saving apparatus of all kinds has enabled us to make our way even against strong and established rivals. You know without my telling you that the products of American factories are selling all over the world, competing in price, or quality, or design, or all of these elements combined, with the products of Germany and England. So true is this, so well do we like the taste of that we have already had that we cry for more. Those who have already developed the field need little information from me, but those to whom it is as yet an untried quantity may be helped by considering what needs to be done to develop this field further.

Our foreign trade requirements.—What the American manufacturer needs to begin and develop an export trade may be classed under two heads—general requirements and special requirements, or perhaps it were better to say, large things and little things.

In the first place, then, much depends upon his own mental outlook upon the foreign field. Just here many an American has come to grief. If a foreign market be regarded as an incident or a flyer amid the constant pressure of a large domestic trade, to receive attention when he needs sales, and to be neglected at other times, then he would better give up thought of any serious export business. His rivals in Germany and Great Britain are on the job all the time. The American who competes in this haphazard way may through a lucky chance or the interest of some export commission house receive some orders, but if they come when domestic business is pressing and are treated at such times as of comparative unimportance, or if the details of the foreign order are considered unworthy of special notice and something other than that ordered is substituted which it is thought will do as well, then farewell to the growth of the foreign business for him. The German will be there searching out just what that man wants, and the Englishman will be offering him goods whose standard quality will not alter for decades together, and no haphazard way of getting or treating foreign orders will long survive that kind of competition. An American manufacturer to secure foreign trade must take it seriously, must be prepared to invest in it with a view to its future development, just as he does at home, to regard it as of equal interest in due proportion to its size to his home trade, to cater to one as he does to the other, and to treat the foreign trade with a patient faith in its growth if his goods and methods are right, because he should know before he starts in that it is "long-distance" business that can not be hurried, and which if it is ever to flow as a river must begin as a brook.

The proper development of foreign trade.—Having determined that he will patiently and steadily develop a foreign trade and, so to speak, "stand the gaff" of expenditure upon it while looking and waiting for future results, he must next remember that the foreigner will not buy from him because he is an American, and that the foreigner may be quite right in saying that American designs, sizes, styles do not suit him. The American manufacturer then must expand his vision. Many a one of them only sees to the 3-mile limit. He must, to succeed, put himself to some degree in his customer's place, study his wants and offer him that which he wants to buy, rather than that which he, the manufacturer, wishes to sell. Therefore, the American manufacturer should go, if he can, or send to that foreign market and acquire his knowledge of it at first hand. He must, indeed, learn a good deal through others, but these others will tell him what it is to their advantage for him to know and no more, and if confined to that, he will work with second hand knowledge. He would not do that at home. He can not long continue to do it abroad. His European competitors know just what they are doing, and the American must learn to do likewise.

He will speedily find that many goods are offered more cheaply than he can produce them, and at once will be forced to decide whether he will lie down or stand up. In the former case he will conclude that the poor efficiency of his labor or the high rate of wages he has to pay make it impossible for him to compete abroad, and he will conclude that the home markets are best for him. If he is minded, however, to stand up he will enter upon a merciless course of self-criticism. He will believe that nothing in his own business is right till he has tested and proved it so. He will be dissatisfied with his plant, his methods of management, of prohuction, of handling men, his costs, his overdead charges, with everything. He will not wait for his customers to find fault with him, he will do his own faultfinding, and if he is sincere and is not imbued with that most hopeless of all industrial diseases called "knowing his own business." he will find every day for years on end something that can be bettered. His superintendent, who, with an indifferent employer, might continue the use of antiquated machines, will on the contrary be doing a fair second-hand trade in them, and when his old equipment has been replaced with new, he will still not be satisfied. Nay, he will go perhaps to the point where he will have machines invented and made for him, or will so make them himself in order to meet a certain need. He will not crowd the soul and life out of his workmen, but will recognize that their prosperity and his are bound in one, and that if his product is to be brought low in cost it must be by furnishing them the very best tools and equipment and the most favorable working conditions. Because only when that is done and liberal and assured pay is added to it can one get that self-discipline enforced which is the life of a high-grade modern shop, for no watchfulness of foreman or superintendent and no pressure from above can take the place of the willingness of brain, added to the zealous hand of a happy, well-paid, well-placed, well-equipped, and contented workman. Physical or nervous overstrain is unprofitable in the shop or mill, as well as in the office. So, side by side, with a broad outlook into the world must go a broad outlook into his own shop. Such a manufacturer will look closely and ceaselessly at his rate and quality of product, and at its sure and steady flow. He will watch his wastes and his unproductive expenses, but the last thing that will worry him will be the rate of wage. If his goods come out with few or no seconds, if his ratio of repairs is small, if his waste of time and materials is kept to a low limit, if his shop is well balanced, if the spirit in his works is that of earnest, steady, quiet enthusiasm, if he is a leader to his men and not a tyrant over them, he will be content if his men earn high wages for his cost sheets will be right. But he must meet the organization of the German and the strength of the Englishman with the keenest study of the quality and the rate of his own production, and he must never be able to say of his own ways "I am satisfied."

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* Address of Hon. William C. Redfield before the American Manufacturers' Export Association, at New York, on September 26, 1911, being part of the Congressional Record of December 6, 1911.

The man with this outlook within and without, whatever his line of product, need not fear to enter the world's competition and given patience he will be successful therein.

American ignorance of foreign conditions.—These are the great things. But some little things are important, too. We have had too much in America the spirit of the classic question, "What have we got to do with abroad?" and this spirit has led to a comprehensive ignorance of "abroad" which has been a sad handicap. I am afraid to speak of our lack of knowledge of common geography, for it is a sad and painful subject. It has its tragic humorous side. One smiles when a Boston house writes to Manila on June 8 and again on June 25, saying on the latter date that they have received no answer to theirs of the 8th, and must insist upon an immediate reply. It is a bit droll to have a New York house refer an inquiry from Panama to its agents in the Philippines, but both of these took place.

I must confess to a letter from my own office not long since covering a statement of a small account, and asking the office in New York to step out and collect it, said account being in Brazil. And I remember asking a clerk where Jamaica was, to be told it was in the Pacific Ocean. If I proceed along this theme my remarks will possibly become more forcible than fragrant, and I will only say that the ignorance of the average American young man and woman as to the world's geography is vast. I have never found, and the inqnry has frequently been made, any school anywhere where they taught geography with any degree of thoroughness. It is really quite important to know in what part of the world a would-be customer is. I have seen heating apparatus recommended for Java. Akin to this is the equally tragic lack of knowledge of foreign languages existing among us. This is epitomized in the old joke: "If the foreigner does not understand English, speak louder." Our own tongue is so good a language and we speak it so well that it almost seems discourteous for a foreigner not to understand it, and we are so accustomed to feet and inches that meters and the like seem disagreeable. I have known American manufacturers abroad to realize with something of a shock that intelligent merchants and manufacturers could not always speak or understand English, and that the French and German and Spanish languages were really practical things in the countries where they prevail. It has been with an amused annoyance sometimes that some of my fellow men have had painfully to realize these things to be true. I remember that at the Paris Exposition a large Chicago house had an exhibit. It was near mine, and after the exposition had been open a month or so, the case containing the goods sent by this house was so very much in my way, for it had stood about a fortnight or more in the aisle, that with my own man I opened it and set it up in the show case belonging to my Chicago friends. There was a lot of literature with it, all in English, and all in feet and inches and dollars and cents. I have more than a suspicion that the house that treated their goods this way have a profound conviction that expositions are no good. Not far away were the exhibits of some very well-known manufacturers in Connecticut which they had put into the hands of a Paris house that had 50 exhibits in charge, and each of them naturally got one-fiftieth of the attention of that house. One day a fine-looking German came and looked over their case intently. He could speak but little English, but after a while came to me and made me understand that he wished to speak to the representative of that exhibit. I managed to tell him that the man came there once a day for a few minutes, and otherwise I knew him not. He went away, and 10 days later returned with his bright, intelligent daughter, who spoke English well. She told me her father had sent home to Germany for her that she might talk English to the representative of the American manufacturer, for her father wanted to buy some of the American tools To my great regret I could not even then find the representative of the American exhibitor, and the couple departed, and the American lost an order.

Catering to the demands of foreign buyers.—The line of least resistance with a foreign buyer is to offer him the goods he wants described in the way he understands them and in the measures and weights with which he is familiar. If a Russian came to St. Louis to sell goods speaking only Russian and with Russian literature, he would not get far. but more than one American manufacturer has tried just this sort of thing. The widespread and growing use of English throughout the commercial world has aided us, but ability to reach a customer in the language and the terms he understands, it is hardly necessary to say it, is helpful.

Changing foreign price lists and discounts.—American manufacturers are charged all over the world with certain sins alleged to be almost peculiar to them—underpaid postage, bad packing, substitutions of goods, inattention to correspondence; long and unexplained delays. All these are in the calendar of evils, and with some justification. To these can be added one special business sin that exasperates foreign buyers and has made some drop American lines that they had taken up. I refer to what seems to be our ingrained habit of changing list prices and discounts.

A foreign buyer takes an interest in a line, puts it in his circulars or catalogues, spends money to sell it, and gets it going, sends in an order. He then receives word that since the last catalogue sent him the price is changed and one is now pleased to quote him so and so. less so much. Or he receives his goods together with a letter stating that the order is filled somewhat reluctantly because the price has meanwhile advanced and future lots will carry the new price. Instantly all the expense the foreign buyer has put upon the goods is wasted. His customers feel that he has tricked them, and the American manufacturer is called very hard names, of which "shabby" is one of the least. I recall one concern, and a large one, the head of which personally supervised the detail of making up every price list, for he said those price lists were the heart of his business and they should be made with such thorough care that they never should be changed. They were not changed for 15 years, and every buyer of that man's goods abroad knows that save for serious cause that list will not be altered. This is true, though in a lesser degree, of discounts. I have known houses abroad either angered by an increase in price in some such way as I have described, or almost equally annoyed by having a stock of goods on hand, and having the manufacturer send out without notice a revised discount sheet in such manner that his foreign agent was obliged to sell out at a loss.

Foreign credits and payments.—In the matter of terms, many of us make the serious mistake of grouping all foreigners as unsafe people to receive credit and of writing rather curt letters that cash with order or against documents are our sole export terms. It is needless to tell this audience that there are houses in almost every large city in the world a debt from whom is a sound asset. I wish more of them owed me largely. Cash against documents is preferred by many buyers as well as sellers, but it is a pity to lose valuable orders from sound houses because a provincial habit keeps us from doing what our competitors do. Do you believe in your own goods? Then, within reasonable limits and when conditions permit, why not let a sound house see or even try them before they are asked to pay? A failure to show this confidence or courage (with caution) has cost orders.

Postage and packing evils in American export trade.—On the subject of insufficient postage, I can only say that there are houses abroad who so frequently receive underpaid letters from America that they simply reject them It is hopeless to correct this evil, this trifle which has cost a good deal of money to our industries—it is hopeless, I say, to correct it until we give up putting the cheapest office boy we have at sending out the mail in our offices. We pay, perhaps, $20 per week to have letters typewritten that are dictated by a man who may get several thousands a year, and we otfen spoil the operation by putting a $3 a week boy to inclose and mail them.

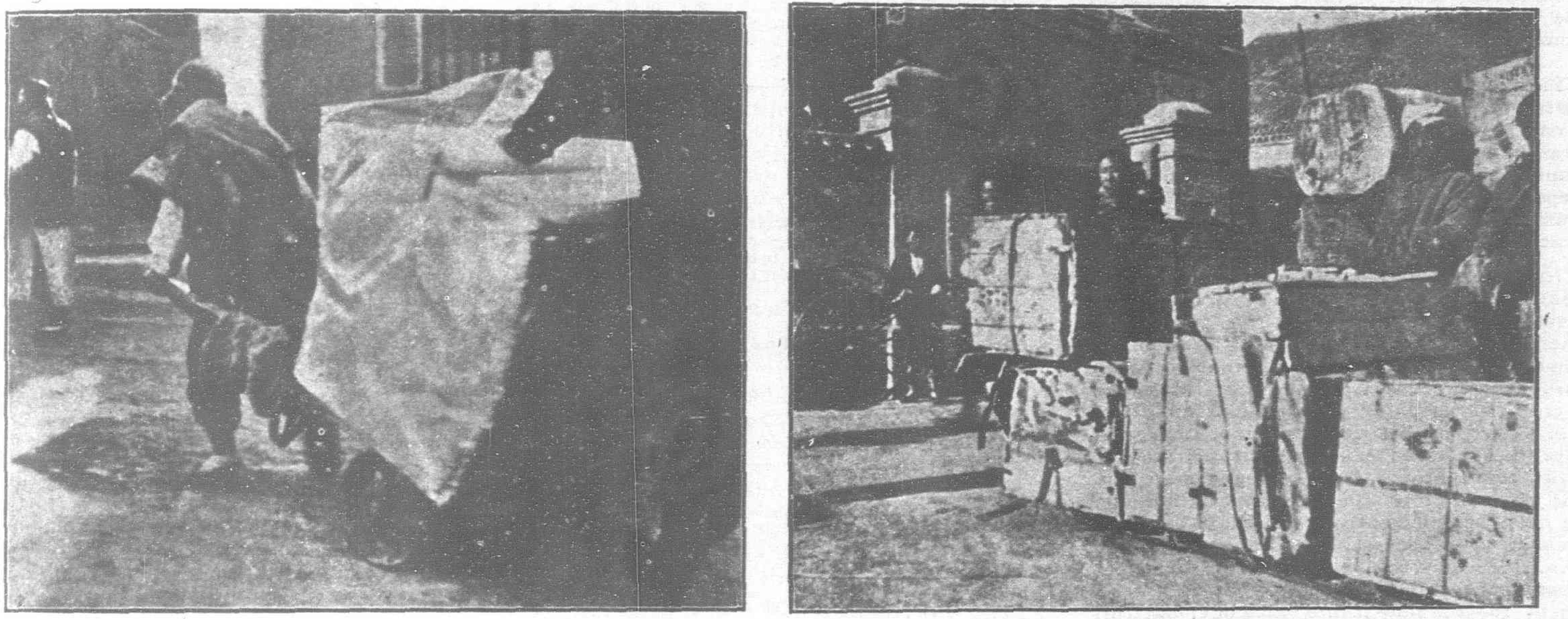
One day I saw a lot of American goods in the Far East all streaked with rust. The buyer was himself an American by birth and training, but he had given up buying those goods in the United States. He said that he was paying 15 per cent more for English goods, and the reason was that the Englishman packed his goods properly and the American would not. He said would not because he had written the American manufacturer pointing out to him that goods going around the Horn and crossing the Pacific should be wrapped in oiled paper or oilcloth to keep them from moisture, and asked that a consignment be so packed. To this the American manufacturer replied that he knew how to pack his goods and would send them out well cared for in the usual way. These were the goods I saw damaged by streaks of rust, and that was the last order that was sent.

I saw one lot of small oil stoves that had been shipped from America, half of which were broken when they arrived. The buyer had requested special care to the packing with this result. That was also the last order.

In one case a green label was not wanted because the native people did not like that color, but when the order was received in America and the standard label was green, the manufacturer or his storekeeper said things about the foolishness of the natives and shipped the regular goods. In due time they came back with freight charges both ways to follow, and no orders came after that.

A shipment for Santos was sent to Rio, and months of delay ensued and much expense complicated by the fact that the shipper kept all the bills of lading in his own desk.

It would not be fair, however, to give the impression that these were average or typical cases among American manufacturers. They are far too numerous and they are an injury to the trade of those who know and do better. An English or German manufacturer can accept a cable order to go by a definite steamer on a fixed future day, for in Europe the railroads cooperate and will take the shipment from the interior to be delivered "for specific sailing." Our railroads will not receive freight on this definite basis, and while, doubtless, they do their best, this uncertainty restricts our industries. We lose steamers now and then and goods lie over sometimes a month. This does not occur abroad. The law will not allow our railroads to accept an export shipment for "specific sailing" and then pay damages if they fail to connect for fear this will be a "rebate." We ought to get rid of this handicap. It is expensive to us in the loss of orders. Let us now refer briefly to one greater handicap under which American manufacturers suffer.


CONDITION OF CASE GOODS PACKED BY CARELESS AMERICAN MANUFACTURERS UPON ARRIVAL IN THE ORIENT

Our merchant navy and foreign commerce. —German and English manufacturers find at their coast line shipping companies eager to facilitate the commerce of those lands. Do we? All the way from Hongkong by way of India to New York I saw not one American flag on a ship. One vessel bearing our flag had been in Calcutta within a year. I saw a neat merchant steamer carrying the flag of Sarawak, a principality in Borneo, and three good merchant steamers carrying the flag of Greece, but none of ours. We have all discussed this theme in public heretofore as if it were a matter for our shipbuilders or our shipowners chiefly to consider, or as if our sailors were most in interest, but this is not so. There is no worker in the factories you represent, nor a worker in any factory throughout our broad land that is not a sufferer by the absence of our own merchant ships, and you yourselves are daily losers by it. Consider what the position of a city like St. Louis would be if all the railroad lines entering it and every steamboat line on the river also were not only owned in Chicago, but were deliberately operated in the special and peculiar interest of Chicago and with the purpose of developing the trade of Chicago at the expense of all others. How long, think you, would the business man of St. Louis prosper under that pressure? But this, gentlemen, is practically what you and your fellows encounter at our waterfront. Your goods there enter, with rare exceptions, into the hands of shipping lines whose chief interest it is to develop the commerce of their own nations. They are glad to get, of course, the business flowing from our shores, and in a degree must so far cater to it as not to lose it, but throughout the preference is given and must be given in their connections and in their management to those who are our competitors and who are their compatriots. If it can be realized that all Americans, manufacturers and farmers alike, who seek export trade are constantly handicapped by having to ship their goods through the hands of our commercial antagonists, we shall be more disposed to cut short the delay in doing something serious to restore our merchant marine. We have talked subsidy and we have talked differential duties, and we have talked free ships, but in this great practical America no men have yet arisen commanding enough to say on this vital theme: Get together, cut out the trivial issues, forget prejudices and passion and party, let us have a conference of all concerned, pledged to some result before it adjourns. Can not personal and special interest be put aside and the demand for something creative come up from every factory in our land so strongly that we shall all know what the owners and the workers in all our mills are coming to know that they are the real sufferers, and that this handicap upon our industries must cease. I have no panacea to offer, no one cure to propose as final, but this one thing I do purpose to do, viz, to support every measure so long as it be righteous that even looks toward reestablishing our merchant marine. It may not be a perfect measure; it may be a very partial measure; but whatever it is, if it looks that way and is clean, I am for it. For we have set off too long one man's "kicks" against the other's prejudice, and rather than please some one we have all fallen into the ditch. It is time to get something done.

American products and foreign competition. —And now, gentlemen, let us frankly, as manufacturers, face certain facts. An attitude that we are able to compete with foreign manufacturers on their own ground while unable to compete with them on our ground can not long be maintained. The day of special privilege for you or me is passing away, not to return. The day of self-help, of standing on our own feet, of facing fearlessly the world in open competition with it is dawning. It may not come abruptly; it should not so come, and it may come with certain painful processes in its readjustments. But coming it is, inevitably. And when it comes our readjustments need not be made at the expense of the workers we employ, nor to our loss either, if we are wise and careful. Already men have begun to learn that to reduce wages induces waste and that such a course is at best a costly and crude process.

You and I must learn that efficiency means three things that always go together and can not be separated, viz, the increase in our output and its improved quality, the increase in what we pay our workers, and because of these the decrease both in the direct and indirect cost of what we make. We are the most efficient people in the world, yet are but beginning to be efficient. We have got to learn to utilize the brains of our workers as we utilize their hands. The best plants anticipate and avoid waste as far as may be by designing, making, protecting, operating their machinery in accord with the laws of its being. When we treat our men this way, use the best there is in each of mind and hand, fitted carefully to the work he best can do, and doing it after careful instruction with the best appliances under the conditions that meet his manhood (mental and physical) best, then we shall save human waste and reach a quality and quantity of product that will free us from all doubts of our power to meet on equal terms the men of any land. So long as we look first at the wage rate and the past or present cost instead of at the product rate and the possible cost we shall all be cowards. He who would export must first be fearless, then patient, and backed by fearless patience, by continued self-criticism and intelligent knowledge and a broad spirit, the most doubtful of us will come to know the fact that American manufacturers are peers to or superior of any in the world and able if and when they choose to meet them fearlessly in the commercial arena of the world.

The relations of capital and labor.—I intend to end here, but there are conditions in our public affairs that seem to call for a word more to this gathering of thoughtful men. The day is passing away when in this land any man or group or corporation can say in effect to any of their fellows, "All that you have is mine if I can get it." The day is passing when an employer can say to his men, "All you have of brain and body and soul is mine at the least return if I can get it." Profits are ceasing to be the sole and supreme law; men doubt the righteousness of a high dividend rate from a factory that does not pay an average wage sufficient for a decent living. Men feel that there are limits to the arbitrary buying of labor at the lowest cost that poverty exacts. There are those who say that for a manufacturer to say his costs are high because his labor is inefficient is to condemn himself. These and similar things are in the air.

Industrial combinations and economic facts. —Together with this is the cry against the great combinations arising from popular wrath at profits thought to be unrighteously exacted or from the unjust destroying of small competitors. Yet we must have large masses of capital in our industries and under strong control, for to produce cheaply we must produce largely. The day of small production has gone, too. But such large grouping of capital must no longer be upon the old basis, but on a new one, which seeks the efficiency of the worker without overstraining him and while rewarding him well. There must come a new spirit which looks more at the man and less at the pay roll, which conserves the man as one

CONTRACTING NEWS

ADVERTISEMENT.—Proposals for frozen fresh beef and frozen fresh mutton.—Headquarters, Philippines Division, Office Depot Commissary, Manila, P. I., January 2, 1912.—Sealed proposals, in triplicate, subject to usual conditions will be received at this office until 11 o'clock a. m., April 5, 1912, at which time and place they will be opened in the presence of attending bidders, for furnishing and delivering about six millions six hundred (6,600,000) pounds of frozen fresh beef, two hundred thousand (200,000) pounds of frozen fresh mutton to the Subsistence Department, U. S. Army, at Manila, P. I., during the fiscal year ending June 30, 1913. The contractor will be required to pay all customs duties. The United States reserves the right to decrease the amount advertised for, upon reasonable notice to the contractor, or to increase the amount with his consent. Each proposal must be accompanied with a bidder's guaranty in the amount of $20,000 or with certified check for that sum on a bank of approved standing in Manila. The bidder to whom the contract is awarded will be required to give bond. Blanks and full information furnished on application to this office or to nearest United States consul. Envelopes containing proposals must be marked: "Proposals for frozen fresh beef and frozen fresh mutton for fiscal year 1913, to be opened April 5, 1912," and addressed to the undersigned.—ALEX M. DAVIS, Major, Commissary, U. S. Army, Depot Commissary.

PROPOSALS FOR COAL.—HEADQUARTERS PHILIPPINES DIVISION, Office of Chief Quartermaster, Manila, P. I.—March 11th, 1912. Sealed proposals in triplicate, subject to the usual conditions, for furnishing the Quartermaster's Department, U. S. Army, approximately 80,000 tons of coal, during the Fiscal Year 1913, will be received here until 11:00 a. m., May 15, 1912, and then publicly opened. Information and blank forms furnished upon application. I. W. Littell, Assistant Quartermaster General, U. S. Army, Chief Quartermaster.

MUNICIPALITY OF SHANGHAI.—Fire Hose—*The Municipal Gazette* announces the following result of tenders:

Name.	Fire Hose.				For total quantity.
	3,000 ft. £ s. d.	1,000 ft. £ s. d.	2,025 ft. £ s. d.	15 ft. £ s. d.	£ s. d.
Arnhold, Karberg & Co.		104. 2.6	52.14.1	10. 7.0 11.10.0	836. 4.5
Jardine, Matheson & Co., Ld.	494. 9.7	150.19.7	158. 9.7	13. 3.6	817. 2.3
"	307. 8.9	79.10.6	71.13 7	10.18.6	....
"	....	....	69. 2.8	....	....
"	....	....	51.16 0	....	....
Ilbert & Co., Ld.	....	....	....	....	775. 0.0
"	....	....	....	....	640. 0.0
"	....	....	....	....	606. 0 0
McGregor & Co.	393.15.0	106. 5.0	81. 0.0	20. 0.0	601. 0.0
Shewan, Tomes & Co.	....	....	111. 7.6	....	765.15.0
Shanghai Stores Co.	450. 0.0	120.16.8	89. 2.0	21.12.0	681.10.8
"	....	....	125.11.0	....	....
P. Heath & Co.	410. 0.0	115. 0.0	79.10.0	19. 0.0	623.10.0
"	....	....	112.10.0	....	....
Dunlop Rubber Co., Ld.	434. 0.0	110.11.11	62.16.6	10.16.0	618. 4.5
"	372. 6.0	93.12. 6	65. 3.0	10.16.0	541.17.6
"	325.10.0	97. 3. 6	46.10.9	10.16.0	483. 0.3
Inniss & Riddle	....	....	....	....	618. 0.0
"	....	....	....	....	363. 0.0
*China & Japan Trading Co.	....	....	....	....	598. 3.6
"	....	....	....	....	597.10.6
"	....	....	....	....	395.16.9
Westphal, King & Ramsay, Ld.	325. 0.0	83. 0.0	72.17 6	14. 2.6	495. 0.0
"	339.10.0	97.10.0	....	....	....
"	230. 0.0	61.10 0	....	....	....
"	191. 0.0	47.12.0	....	....	....
Middleton & Co., Ld.	322. 0.0	82.10.0	74. 0.0	14. 5.0	492.15.0
Dodwell & Co., Ld.	316. 0.0	8.1 5.0	72. 5.0	14. 5.0	483.15.0
Shanghai Electric & Asbestos Co., Ld.	319. 5.0	81. 6.8	73. 0.3	14. 6.6	487.18.5
Samuel & Co., Ld.	....	....	....	....	408.10.5
Scott, Harding & Co.	....	....	....	....	386. 0.0
Garrels Borner & Co.	....	....	....	....	316. 0.0
"	....	....	....	....	410. 0.0
"	....	....	....	....	422. 0.0
"	....	....	....	....	508. 0.0
"	....	....	....	....	7[illegible]1. .0
"	....	....	....	....	868. 0.0
F. Schwarzkopf & Co.	$8,250.00	$1,750.00	$1,316.25	$532.50	1,110.16.4
J. W. Gande & Co.	Tls. 4,158.00	Tls. 712.25	Tls. 848.87		
	Tls 204. 49 at ex. 2/6....			....	740. 9.0
Andersen, Meyer & Co.	Tls. 1,337.00	Tls. 236.00	Tls. 421.00		
	Tls. 53.00 at ex. 2/6			....	268. 7 6
Westphal, King & Ramsay, Ld.	(omitting 2,025 feet)				G $2,347.00

TWELVE MILES TRIPLE BRAID WEATHER-PROOF COPPER WIRE FOR ELECTRICITY DEPARTMENT:

Innis & Riddle	£230: 9: 0
Brighten, Molcolm & King Ld.	173: 15: 0
Garrels, Borner & Co.	173: 0: 0
Shewan, Tomes & Co.	159: 15: 6
British Insulated & Helsby Cables, Ld.	155: 15: 0
Siemens China Elec. Eng. Co.	152: 0: 0
Calder, Marshall & Co.	143: 2: 9
Arnhold, Karberg & Co.	142: 10: 0
United States Steel Products Co.	140: 12: 11½
*Andersen, Meyer & Co.	139: 4: 7
Samuel & Co., Ld.	133: 17: 0

Supply of 35 miles hard-drawn bare copper wire for the Electricity Department.

Brighten, Malcolm & King, Ld.	£4300: 0: 0
Inniss & Riddle	3990: 0: 0
Samuel & Co., Ld.	3954: 0: 0
Siemens China Elec. Eng. Co.	3731: 0: 0
United States Steel Products Co.	3723: 0: 0½
Andersen, Meyer & Co.	3688: 2: 11
Garrels, Borner & Co.	3662: 15: 0
Shewan, Tomes & Co.	3651: 10: 0
British Insulated & Helsby Cables Ld.	3638: 0: 0
Calder, Marshall & Co.	3607: 7: 3
*Arnhold, Karberg & Co.	3449: 18: 6

*Accepted.

ROYAL SOUTHERN RAILWAYS—Tenders for 200 freight cars—The following was the result:

FIRM.	C. I. F. price.	F. O. B. price.	Delive after
Les Ateliers Metallurgiques, Belgium	£28,229-3	£21,114 (Antwerp)	28 weeks, and 50 every 4 weeks.
Gesellschaft Harkort, Duisberg, Germany	£26,286-7	....	18 weeks, and 20 every 4 weeks.
Cravens Ltd., Sheffield	£36,993 4-4	£28,660-2-6 (Middlesbro')	12 weeks, and 40 every 4 weeks.
F. C. MacDonald and Co., Ltd., Glasgow	£34,994-10	£28,048 (Middlesbro')	12 to 14 weeks, and 20 every 4 weeks.
Birmingham Railway Carriage and Wagon Co.	£32,369	£25,165 (Middlesbro')	18 weeks, and 40 every 4 weeks.
Leeds Forge Co.	£32,204	£28,350 (Liverpool)	20 weeks, and 100 every 4 weeks,
Gloucester Railway Carriage and Wagon Co.	£32,968	£28,968 (Middlesbro')	16 weeks, and 40 every 4 weeks.
La Brugeoise Saint Michel Co., Bruges	£25,494-10	£20,960-10 (Antwerp)	100 in 17 weeks, balance in 4 weeks.
Metropolitan Amalgamated Railway Carriage and Wagon Co.	£31,025-22	£21,122-12	10 weeks, and 80 every 4 weeks.
J. Goosens, Germany	£13,596	£11,596	16 weeks, and 40 every 4 weeks.
S. A. Franco-Belge Ateliers de la Croyere, Belgium	£26,414	£20,000 (Antwerp)	32 weeks complete.
N. V. Industrieele Handel Maatschappij, Rotterdam	£20,866-14	£17,569-14 (Antwerp)	14 weeks, and 25 every 4 weeks.
S. A. B. Marcinelle (agents, Louis T. Leonowens, Ltd.,)	£34,410-9	£23,851-17 (Antwerp)	30 weeks 40 in 4 weeks.
A. G. fur fabrication von Eisenbahn-Material, Germany	£37,453	£28,583 (Antwerp)	20 weeks, and 30 every 4 weeks.
Stableford and Co. Ltd., Coalville	£32,893-2-2	£27,080 (Middlesbro')	14 weeks and 40 every 4 weeks.
Machenish, Prussia	£26,618-14-3	£19 270-10-7 (Antwerp)	15 weeks and 20 every 4 weeks.
S. A. de Travaux Dyle et Bacalan	£27,991-5-4	£21,763-11-4 (Antwerp)	24 weeks and 50 every 4 weeks.
Usines de Braines le Comte (agents S. A. B.)	£29,370	£21,961 (Antwerp)	20 weeks and 50 every 4 weeks.
Magor Car Co., New York, (agents, East Asiatic Co.)	£33,910	£25,897 (Antwerp)	6 months in one or two lots.
Blake Boiler Wagon and Engineering Co., Darlington (agents, East Asiatic Co.)	£32,621	£25,414 (Middlesbro')	15 weeks and 70 every 4 weeks.
Beaume & Marpent (agents, G. Kluzer and Co.)	£32,440-3	£23,001-10 (Antwerp)	25 weeks in all, 100 every 4 weeks.
Orenstein & Koppel (agents, Windsor and Co)	£25,828	£21,184-12 (Antwerp)	ex works 4 to 5 months 30 to 40 every 4 weeks.
Midland Railway Carriage and Wagon Co., Shrewsbury (agents, Windsor and Co.)	£39,233	£20,500 (Liverpool)	26 weeks, and 100 every 4 weeks.
Von der Nypon and Charlier, Coln (agents, Windsor and Co)	£26,295	£20,797 (Antwerp)	26 weeks, and 100 every 4 weeks.
Railway Carriage and Wagon Co., Breslau (agents, Deutsch-Siam Trading Co.)	......	£27,581-14-4 (Hamburg)	24 weeks, and 50 every 4 weeks.

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of its primary thoughts, which does not regard a shutdown as a reasonable way of handling a great plant that was meant for production. There must be a change in our philosophy of labor. We must learn the difference between cheapness and economy. We may think well to crowd our machinery to its limit and scrap it in a few years because a new invention shall have then replaced it; but we must learn not to crowd men that way, for we can not scrap men. The man can grow, the machine can not, and we must be sufficiently scientific in our management to avail ourselves of the growth of the man. We must be intolerant of inefficient labor by teaching it and by paying it sufficient to stimulate it into efficiency; but this must not be done as a driver would drive slaves, but as a leader would lead men.

Industrial efficiency and the export trade.—There is distrust in the public mind of our great industries because men feel that they have exploited the men who do their work and the people who buy their products, and this distrust must be removed by a facing about of our captains of industry till they shall take pride in paying high wages, till threats of economy by cutting pay rolls shall be considered disgraceful, till the men in the mill shall be as the producing factor—one of chief concern. I say these things must come, and in so far as they have come in the places where they have arrived there is more to day of industrial peace and plenty and profit than in the darker corners of our factories. We must find a way to combine the living and expending wage with the grouping of capital and the growing of product, so that the human forces contained within these lines shall work together. Too much of our criticism is merely tearing down. Let us begin to build, and one of the first steps in this rebuilding, for it is no less, of our industrial structure will be to ask ourselves sincerely and searchingly the question I have hitherto suggested, "Where are we wrong?" and to answer that question fearlessly, even though it may require our putting aside the prejudice and the practice of the past. When this shall be done, our exports, which, large as they are, are perhaps less than 5 per cent of our total commerce, will so expand that, since the markets of the world are steadier far than the markets of any one country can be, our factories will run full time, filled with well-paid and happy people, to the profit of their owners and to the public weal.

FAR EASTERN RAILWAYS

New Siberian Railway.—It is now proposed to construct a railway to the north of Lake Baikal in view of the possibility of the Za-Baikal line falling into the hands of an enemy and rendering the Amur line useless. This northern route would have the advantage of connecting Irkutsk with the Amur and pass through the more thickly populated areas. It will cross the Lena so as to give a western Amur connection. The cost is estimated at 10,000,000 roubles.

Meklong Railway Co.'s Report.—The operations for the year show a large increase in revenue. Four fish cars and one open freight car were added to the rolling stock. The following is the report presented at the last annual meeting held at Bangkok for the year ended December 31, 1911:

"The Directors have pleasure in presenting to you the Balance Sheet, Working and Profit and Loss Accounts of the Company for the year ended December 31, 1911. The Working Account for that period shows a gross income of Tcs. 333,281.04, and expenditure amounting to Tcs. 105,757.47 The Profit and Loss Account, after deduction of Debenture Interest, Concession, Redemption, Depreciation, and reducing Amalgamation Account, shows a net profit of Tcs. 143,152.42. To this has to be added Tcs. 10,227.92 carried forward from the previous year making the total amount available: Tcs. 153,380.34. The Directors propose to deal with this amount as follows: (1) To pay a dividend of 5%, Tcs. 111,500; (2) To pay Directors' fees, Tcs. 8,000; (3) To pay Manager's bonus, Tcs. 5,575; (4) To place to Statutory Reserve, Tcs. 6,478.87; (5) To place to Contingencies Fund, Tcs. 8,666.21; (6) To carry forward to next year, Tcs. 13,160.26. Total Tcs. 153,380,34.

The Paknam Railway Co., Ltd.—The report for the second half of the year 1911 shows a net profit of Ticals 34,582.36 out of which a dividend of 5% was paid and after paying director and auditors' fees, managers' bonus and making an addition to the statutory reserve, Ticals 2.408.42 were carried forward. The dividend for the first six months was 9% making in all for the year 14%.

It is proposed to relay 5 04 kilometers of track with new steel leaving only a balance of nine kilometers to relay. Arrangements have been made with the Siam Electricity Co. to electrify the line from Hua Lampong to Klong Toi, a distance of 5 kilometers.

Japan Railway Revenues.—The total receipts on all lines during January was 7,522,970 yen, 3 689,410 yen of passenger fares and 3 833,560 of freight receipts, an increase of 660,240 yen compared with the corresponding period of last year. The total receipts since April, 1911, were 81,132,224 yen, an increase of 8,576,964 yen. An income of about 10,000,000 yen over the estimate by the end of the present fiscal year, which closes March 31, is anticipated.

Cravens Ltd., Sheffield..	£37,170-1	£28,803 (Middlesbro)	12 weeks, and 40 every 4 weeks.
Nesseldorfer Waggonfabrik.......	£20,383	£14,828 (Hamburg)	26 weeks and 100 in 4 weeks.
Officine Metallurgike Togni, Brescia. (agents, A. Diana and Co.).	£30,264-7-6	£22,794-14-6 (Genoa)	50 in 25 weeks and 25 every 4 weeks.
La Construction Manage. (agents, Howarth Erskine, Ltd.).......	£26,551-13	£21.241-13 (Antwerp)	28 weeks and 50 every 4 weeks.
Brush Electrical Engineering Co., (agents, Howarth Erskine, Ltd.)...........	£26,[illegible]93	£21,573 (Middlesbro)	26 weeks and 50 every 4 weeks.
Ditto. Ditto.	£28,424	£21,573 (wheels at Middlesbro)	

The Panama Railroad.—Freight carried on the Panama Railroad during the three months ending September 30, 1911, showed an increase of 86,678 tons, or 26 per cent, over that for the corresponding period during the previous year, the total for the 1911 quarter being 419,108 tons. Through freight going from Colon to Panama shipped from New York and other Atlantic ports amounted to 55,029 tons, an increase of 30,419 tons; from Gulf ports, 7,071 tons, an increase of 1,139; and from Europe, 25,257 tons, an increase of 9,199. Of the through-freight coming from Panama to Colon, New York and other Atlantic ports took 44.568 tons, an increase over the 1910 quarter of 22,718. Gulf ports took 4,902 tons, against none in the year before; and 14,072 tons went to Europe, a decrease of 1,526.

Chinese Railway Extension.—An agreement has been concluded between the Chinese and Japanese Commissioners at Mukden, according to Consul General Fisher, regarding the extension of the tracks of the Peking-Mukden line across the tracks of the South Manchurian Railway and the removal of the Mukden station of the former railroad from its present position to the end of the proposed extension. The Chinese Government agrees that the Peking-Mukden Railway Administration shall build a line between the proposed new station and the station of the Manchurian Railway Co., in order that the lines may make good connections and thereby extend traffic. The Japanese Government agrees that the South Manchurian Railway Co. shall raise an embankment and build a bridge over the extension of the Peking-Mukden line at the point of intersection of the two roads.

F. M. S. Railways—The Department will expend over $5,000,000 (Malaysian dollar-$0.567 American currency) on new construction work. This includes the Pahang-Kelantan line, the extension northward to Kedah, the completion of the Kuala Selangor line, the deviation of the main line from Kuala Lumpur to Salak South and a line to the Rawang coal field. Seven locomotives ($140,550), 100 goods wagons ($147.950), and additional passenger stock ($169,388) will be purchased.

Railway Ferry Boat for the Sunning Railway—This vessel has been purchased for the purpose of carrying trains across the Southwest River at Niu-wan. It is 350 feet in length, 55 feet wide, and is capable of carrying 15 cars.

Formosan Railways—A night service was inaugurated by the Imperial Taiwan Railways in December.

Obituary—A cable from London under date of February 14 announces the death of Mr. E. S. Lindsay, M. I. C. E., formerly chief resident engineer of the British section of the Kowloon-Canton Railway, at Grindelwald, Switzerland, where he was enjoying a vacation.

The deceased was a leading British railway engineer who served on construction work on railways first in Spain and later in India. He was Acting Chief of the South Indian Railway in 1908 when his services were lent to Hongkong as Chief Resident Engineer of the British section which position he held until December, 1911, after the inauguration of the section. When he left for Europe, in recognition of his continuous service without a vacation, the Hongkong Council voted him a substantial sum and he was taking rest before undertaking any new position when the sad event occurred.

Mr. Lindsay was regarded as one of the most progressive of British railway engineers and his passing out is considered a severe loss to the engineering profession.

Russian Railway Revenues—The following is an excerpt from the report of the Ministry of Communications for 1910: The gross income of all the lines was $495,422,087, or $33,614,057 more than in 1909. The expenses for 1910 were $324,248,258, or $5,238,848 less than in the preceding year. The net profit was $169,542,293, or $38,281,850 more than in 1909.

The net profit on the State Railways was $106,912,319 and on the private ones $62,629,923. The Southern Railway gave the most profit, $15,478,772; next came the Southwestern Railway, with $15,277,943; the Moscow-Kursk and Nizhni-Novgorod Railways gave $6,117,030; the Cis-Visla Railway, $5,703,153; and the remaining railways less than $2,575,000.

The State Railways in Asiatic Russia, the Tashkend, Siberian, and Middle-Asiatic Railways, enjoyed an income larger than their expenses. The Trans-Baikalian Railway gave a loss of $5,218,092.

From the private railways the largest profit was made by the Vladikavkaz, Southeastern, and Moscow-Kief-Voronezh Railways, $8,391,704, the Moscow-Kazan Railway, $7,717,208; the Moscow-Windau-Ryhinsk Railway, $7 089,597, and the Warsaw-Vienna Railway, $5,623-280. The remaining railways gave less than $515,000 profit.

Japanese Railway Construction.—In discussing the railway program Vice-President Hirai of the Railway Board stated that while the Osaka Harbor Railway, including a northern and southern line, was under consideration in connection with the harbor improvement and that the southern line was adopted, no active construction was anticipated for the present.

A supplementary budget will be submitted by the Government to complete the construction of the Hokkaido railways as the cost of material and labor had so advanced that the program providing for the construction of 1,000 miles of line to cost 30,000,000 yen to be completed in 1914 could not be carried out.

The Atami line of railway is being surveyed and an estimate of 300,000 yen was submitted for 1912. This is a proposed circuitous line connecting Odawara, Atami and Yugawara districts.

It is estimated that the Railway Board will purchase during 1912 railway supplies to the value of yen 10,000,000.

The Kiangsi Railway Loan.—This company, according to latest advices, is negotiating a new loan of four million taels with Japanese capitalists. Previous to the revolution an application for a loan from Chinese bankers was vetoed by the Board of Communications. This company's original plans included the construction of lines in Kiangsi from Kiukiang to the Kwangtung frontier via Nanchang, a distance of 460 miles with branch lines to Fukien Chekiang and Yuanchow.

South Manchuria Railway Dividends.—Due to the bubonic plague the profits for the year 1911 amounted to 1,300,000 yen against an estimate based on the business of 1910 of 3.500,000 yen. The estimate for 1912 is placed at 1,500,000 yen.

Korean Railways.—Mr. Oya, chief of Railway Affairs of Chosen, states that the railway loan, floated in 1911, amounted to 8,000,000 yen, and the profit for the same year totaled 600,000 yen. If the loan be depended on till the end of 1915 as the source of the funds, a profit of about 2,000,000 yen could be realized from 1916, but the delegate did not think any higher profit would be difficult. The charges were high in comparison with those at home, but not so high when the high amount of expenses and the relations with the connected railways are taken into consideration. The Authorities were planning a reduction of charges. As to the relations of immigrants and the railway no special accommodations had as yet been made, as the number of immigrants traveling in a body did not at present exceed 20,

FAR EASTERN ENGINEERING CONSTRUCTION, COMMERCIAL AND FINANCIAL NEWS

ELECTRIC RAILWAYS, LIGHT, POWER, TELEGRAPHS, TELEPHONES, AEROPLANES, ETC.

MEMORIAL WIRELESS TOWER FOR SAN FRANCISCO.—In conjunction with the Panama-Pacific Exposition, the naval authorities propose erecting a tower rising 1350 feet above sea-level with a radius sufficient to reach all the stations east as far as Cuba and maintain communication with Eastern Asia across the Pacific. This is part of the program proposed by Secretary Meyer involving an outlay of $1,000,000.

SINGAPORE-PENANG TELEPHONE LINE—The installation of a telephone line connecting those two points is being considered by the F. M. S. government and if approved is expected completed by 1913.

AUTOMATIC STABILITY FOR AEROPLANES.—Consul General Fuffiths of London writes that according to a London publication an engineer in India, who has given close study to the question of aerial flight, has made an important discovery regarding the equilibrium of aeroplanes. After many tests he has succeeded, it is stated, in securing an almost automatic stability in flight. A recent test was made in India with the invention fitted to an aeroplane model. The craft was cast into the air from a high point and it immediately floated, being influenced only by a gradual drop toward earth. The aeroplane moved quickly. It maintained its equilibrium throughout.

It is claimed that the principle of the invention, if built into an aeroplane, would render perfect the "floating" of an air craft upon an "even keel" and would make toppling over or sudden dropping impossible. Sharp turns can be made also, it is said, and an accident to the motor is rendered of small importance. The details of the invention are a secret. The British War Office will be asked to test the contrivance.

The authorities have also been offered a torpedo for aerial use invented by an Australian engineer.

CHIKUMAGAWA WATER POWER ELECTRIC COMPANY—A charter has been granted the above company to instal a hydro-electric plant at Kita on the upper reaches of the Chikuma. The capital of the company is represented by 8,000,000 yen and the development of 50,000 h. p. is proposed.

CHINESE AVIATION—The announcement was made last month that Z. Y. Lee, a Chinese aviator, would make several ascents at the Kingwan race course, Shanghai, on the 9th or 10th of this month. Lee was born in Ningpo and has studied aviation in England where he is a member of the London Royal Aero Club. He has made successful ascents in England and France and uses an Etrick monoplane of Austrian design.

SPECIAL TRAINS TO BAGUIO—ON February 26 the following schedule went into effect:

Special Baguio trains run leaving Manila at 7:56 a. m. on Mondays, Wednesdays and Fridays, returning from Baguio on Tuesdays, Thursdays and Saturdays, leaving Camp 1 at 10.00 a. m. and arriving at Manila at 5.16 p. m. First and third class tickets only will be issued by these trains, the round trip rates for which are ₱27.90 and ₱12.00 respectively.

Second class round trip tickets are issued at ₱23.00, available on ordinary trains only, not on the specials. All round trip tickets include automobile fares and are available until July 1st. First class passengers are allowed 50 kilos of baggage free on the railroad, and third class passengers 30 kilos free on the railroad only. Children between the ages of three and nine will be required to pay half fare and will receive half baggage allowance.

MANILA ELECTRIC EXPANSION.—Connection with the new port has been authorized by the Municipal Board. The company will construct, maintain, and operate, its lines of railway on the streets leading to and located on the new port as follows:

(*a*) Bagumbayan from its intersection with calle Real, Ermita, to its intersection with the Malecon Drive;

(*b*) The Malecon Drive from its intersection with calle Bagumbayan to Twenty-fifth street:

(*c*) Twenty-fifth street from its intersection with the Malecon Drive to Muelle San Francisco.

(*d*) Muelle San Francisco to its intersection with Muelle Tacoma;

(*e*) Muelle Tacoma to its intersection with Chicago street;

(*f*) Chicago street to its intersection with Seventh street;

(*g*) Seventh street to its intersection with Muelle Tacoma;

(*h*) Muelle Tacoma to its intersection with Seventh street.

ELECTRIC TOWING LOCOMOTIVES FOR THE PANAMA LOCKS—The Railway Age Gazette announces that the contract for building an electric locomotive to be tried out in canal service at the Isthmus has been awarded to the General Electric Company, Schenectady, N. Y. If this locomotive, after sufficient tests, proves to be adequate for service 39 more will be ordered from the same company. This is in accordance with the plans of the commission. The system of towing outlined has been patented by Edward Schildhauer, and the commission has the right to use the machines covered by this patent without making any compensation therefor. Under this system four locomotives are required to tow a vessel of moderate size through the locks. Two are to be used ahead, one on either wall, for towing; and two behind, trailing. The latter are for the purpose of keeping the vessel in the middle of the lock and to bring it to a stop when entirely within the lock chamber.

JAPANESE CABLE EXPANSION.—According to Chief Tanaka, of the correspondence bureau, since the outbreak of the present disturbance in China, a remarkable increase has been shown in the telegraph messages between Japan and China, so that the equipment which had been already fully taxed before that event, became suddenly inadequate. The result was the necessity for laying a new telegraph line between Tokyo and Nagasaki. The same thing was true as to the Saseho-Dairen line, but, as an addition to that long-distance line required a long time, an increase of four lines via Korean line was decided upon. Consequently an addition to the submarine cable between Shimonoseki and Fusan had become necessary. For all these constructions and repairs, 320,000 yen was asked, and for the consequent increase of officials and experts and other expenses, 5,000 yen.

AVIATION IN JAPAN.—The *Japan Times* states that the Military Aviation Investigation Committee is earnestly pushing on its work, and has now at its disposal for flying experiments, No. 1 biplane, constructed on Captain Tokugawa's design, which has undergone a thorough rebuilding, especially in the taile wing, and the Farman and Wright machines recently purchased abroad. Besides it has a huge dirigible of about 3,500 cubic feet capacity, built wholly on its own designs, and they also expect shortly a Parsival dirigible from Germany. When the monoplane designed by Dr. Yokota, one of the Investigation Committee, is completed, it will also be put at their service. This last machine is to be equipped with a propeller at the extreme end of the tail-wing, which is claimed by the designer to be a unique feature. Captain Tokugawa has under contemplation a monoplane of his design.

The gap left by Major Hino in the rank of the military aviators is expected to be filled by Captain Akiba, who is at present studying aviation in France, and will shortly return to Japan with a degree from an aeronautic institute near Paris. Lieutenants Ito and Yamase and Captain Umekita will appear at the aerodrome with fresh vigor and spirits this spring. Captain Sakurai, fresh from his experiences abroad, and Lietenant-Colonel Somiya, a new member of the Investigation Committee, will display their ability as practical aviators.

PUBLIC WORKS, DOCKS, WHARVES, BUILDINGS, ETC.

AN ADDITIONAL RESERVOIR FOR MANILA.—The unusual dry season has had the effect of reducing the supply of water from the Montalban watershed which in former years was most plentiful. At the present time there are three city reservoirs. They include the old deposit, 19,000,000 gals.; the new reservoir, 53,000,000 gals.; and the Montalban storage of 200,000,000 gals., making a total of 272,000,000 gals. and sufficient to supply the city for 22 days under the severest drought conditions. Plans have been prepared for duplicating the new reservoir which upon completion will obviate the use of the old deposito.

THE SHIMONOSEKI BRIDGE.—Consul General Sammons of Yokohama writes that the plans for this bridge which will cost 16.000 000 yen are being prepared by T. Hiroi, Chief of the Department of Technology of the Imperial University. He says:

"A party of Osaka business men is also considering forming a company to build this bridge; the bridge plans of this proposed company were drawn by the Murakami Architect Company (now the Osaka Engineering Company); and I understand a copy of this plan was sent to the inventor of the Force Bridge System in England. Mr. Horiuchi gives it as his opinion that the style of bridge most likely to be adopted is the cantilever bridge of the Force Bridge System. The proposed bridge is to act as a connecting link between the Sanyo and the Kyushu Railway systems, as well as for general traffic. The length of the bridge, which is to be constructed at the narrowest point of the straits, will be about 3,890 ft., and it is anticipated that the standard gauge tracks will be utilised. It is probable that electricity will be used as a motor power. It is estimated that daily receipts for freight and passenger carriage will amount to $1,850 a day, and that of this $250 per day would be required for working expenses. Ferries are now used, and it is estimated that 5,000 tons of merchandise are moved daily.

BUILDING CONSTRUCTION IN MANILA.—According to the report of the Inspector of Buildings, 500 buildings of strong materials were erected during 1911 and represented a cost of ₱2,279,725. Light material buildings to the value of ₱170,670 were also erected.

THE NEW IMPERIAL HOTEL—Plans have been completed for a new structure to cost 2 000,000 yen. The site will cover an area of 16,000 square yards and the construction is to be of stone foundations with granite facings and reinforced concrete. Kyoto tiles will be used for roofing. About 250 bedrooms will be provided.

PROPOSED U. S. CONSULAR BUILDINGS AT YOKOHAMA.—A bill has been introduced in congress authorizing the expenditure of $100,000 for the construction of new headquarters at Yokohama on a beautiful site donated by the Imperial Japanese government. If the appropriation is secured the construction will be of reinforced concrete.

Manila Elks Expand.—This society has concluded arrangements for the construction of a ₱6[illegible]000 wing to its present formidable club building. This addition will be three stories and include a new dining room, two private dining rooms, lounging rooms, large verandahs, etc., and an elevator to the roof garden.

Special Philippine Public Works Loans.—The Philippine Government is withdrawing the gold standard fund amounting to ₱4,500,000 from American banks where it is drawing a rate of interest from 2½ to 3% and is lending it out to the different provinces for public improvements at 4%. Among the recent allotments made are the following:

₱60,000 to Bulacan province, for bridges between Malolos and Hagonoy.

₱50 000 to Pangasinan province for road work.

₱162 000 to Pangasinan province for roads and bridges on the Rozales-Binalonan road, Lingayen Alamemo and Balmeaguin roads.

₱30,000 to Nueva Ecija, for roads and bridges.

₱[illegible]00,000 to La Union, for the Maragayap-Carlatan bridges on the Bacnotan north road.

₱20,000 to Tarlac for the Tarlac Victoria road.

₱50,000 to Tarlac for bridges on the Tarlac-Gerona Tarlac-Le Paz, Tarlac-Murcia and Gerona Paniqui roads.

₱60,000 to Pampanga, for the purpose of erecting the Porac-Angeles, Apalit and San Fernando bridges.

₱35,000 to Iloilo, for completing the provincial building and constructing a jail.

₱18,000 to Capiz, for completing the provincial building.

₱67,500 to Capiz, for construction of bridges.

₱32,000 to Capiz, for roads and bridges.

Municipal Tennis Courts.—Ten public tennis courts are to be built in Manila's sunken gardens and the bastion near Victoria Gate will be transformed into an up to date club by the city of Manila.

SHIPBUILDING, MERCHANT MARINE AND FISHERIES.

The Hongkong and Kowloon Wharf and Godown Co. Ltd.—The report submitted to the shareholders indicate a profit of $279,228 77 available for distribution as follows:

To pay a dividend of 6%, $180,000.00; To write off launches, $4,878.26; To write off lighters, $31,453.18; To write off machinery, $10,455 34; To write off Kowloon wharves, $21,371.02; To write off West Point wharf, $454 61; To write off railway and rolling stock, $8,220..73; To write off sheers, $3.000.00; To carry forward to new account, $19,393.63—$279,228.77.

Taikoo Dock Company's Activity.—The new steel screw steamer built by the Taikoo Dockyard and Engineering Co. of Hongkong for Messrs. Alfred Holt & Co. for service in the Deli trade was launched early this month. The vessel is 200 feet overall, 31 feet 6 in beam, and has a depth from awning deck of 21 feet 6 in. The gross tonnage of the vessel is 800. The vessel will be equipped with triple expansion engines built by the dock company. The contract speed is twelve knots.

Yokohama Maru Launched.—This new steamer built by the Mitsu Bishi Dockyard and Engine Works at Nagasaki for the Nippon Yusen Kaisha was launched last month. This is a new type of vessel and was designed for the Hongkong Seattle freight service although provision is made to convey a limited number of passengers. She is a steel twin-screw steamer, 415.6 feet in length; 30 feet depth, and a gross tonnage of 6.200. The engines are to be triple expansion reciprocating supplied by four cylindrical boilers and capable of a speed of 15 knots. Accommodation is provided for 28 first class passengers amidships, and 216 steerage.

Motor Boats for U. S. Government.—Two motor boats built by Messrs. W. S. Baily & Co. Ltd. of Hongkong for the Division of the Philippines exceeded contract speed in the trial runs in Kowloon Bay last month. The boat made 9 knots loaded and 10 knots light while the contract called for 8 knots. These vessels are 70 feet long with a 15 ft beam fitted with boom and wench with gear for towing and submarine cable work. They are of teak and specially designed for work in heavy seas. The motor engines are 100 h. p. of the speedway six cylinder type using gasoline.

The Hongkong and Whampoa Dock Co. Ltd.—The report for the half year ended December 31 shows a profit for 1911 of $142,299.13 or about double the result secured the previous year. In his address at the meeting of shareholders February 17 M. G. H. Medhurst, who presided, said:

The six months under review have been to us, in common with our neighbours, a period of much anxiety, and the unsettled state of government in China has had a very depressing influence on trade generally. Quite a fleet of steamers have departed from the coast and consequently our business in docking has been less than anticipated. On the other hand we have had a goodly share of other work, which has kept our establishments fairly well employed and we can now only wait and hope for a return of settled conditions in China and as a result an increased volume of trade, which is all we require.

The profit for the past six months, as you will see, is $75,704.10 and if you add to this the profit for the first half of the year, we get a total for twelve months working of $142 299.13, more than double the amount of our profit for the year 1910. Your Directors recommend that $50,000 be appropriated to payment of a dividend to shareholders for the six months at the rate of 4 per cent. per annum, to write off $30,000 from our plant and to carry forward the balance of $149,591.07 to new account, and it is hoped this will meet with your approval. It will be noticed that the sum of $74.706.23 has been expended on the Company's establishments which includes the final payment for No. 1 Dock extension. Our lengthened dock is now in daily use, and a week ago the largest steamer visiting Hongkong, the Minnesota, was accommodated at Kowloon. All our workshop plant has been maintained at a high standard of efficiency and the cost of same paid out of revenue. The same remarks apply to our fleet of tug boats, lighters and small craft. The dredger, Canton River, continues her charter at Macao in connection with the harbour improvements there. To our Chief Manager, Mr. Dyer, and his capable and energetic staff I consider our thanks are due for the improved results now placed before you, and I feel sure that they will do all in their power to further in every way the interests of the Company in the future.

Panama Canal and Shipbuilding Activity.—There is great activity among the shipping lines in preparation for increased business following the opening of the canal. The Blue Funnel Line will add two new steamers to the line. One of them, the Talthybius, destined for the Liverpool-Tacoma service, is 14,000 tons. The Nippon Yusen Kaisha have two new steamers, known as the Yokohama Maru and the Shidzouka Maru. The Kosmos line will have four new steamers for the Pacific trade, each of about 12,000 tons. The Harrison line is building three large steamers—the Actor, Sculptor and another vessel. The Swedish-Johnson line, a Christania firm, has ordered four steamers of 8,000 tons register from British firms; the Holland-Amerika line of Rotterdam has ordered two additional steamers for its fleet, each of 10,000 tons. The steamer Inkula of the Gulf Transport Line is being sent to the Sound. The Leyland, Royal Mail Steam Packet and other lines now trading to the Gulf of Mexico are reported to have plans for sending vessels to the North Pacific.

Kabr's New Shipping Co.—The Nan-yo Kisen Kaisha with a capital of Yen 3,000,000 has been organized in Kobe for the purpose of inaugurating a service covering the south sea trade. The promoters are K. Takenonchi, Baron Noda, and H. Mikami.

World Cruise in Forty-foot Boat.—Three Americans of Olongapo, P. I, propose making a trip to New York in a 40 foot ketch rigged 16 ton sail boat having a 14 foot beam and a draught of four feet, six inches. She carries 1,060 square feet of canvas and the length of main mast is 39 feet 10 inches. A cabin amidship and store rooms forward and aft feature provision for the comfort of the party. The longest stretch at sea is expected to be confined to about 40 days. They have chirstened the vessel, the "Can Do."

New System of Towing.—The *London Times* describes the new method as follows:

Tests of a new towing system invented by a German Government engineer, Herr Koss, have been recently made on the Hiltrup section (1 415 miles in length) of the Dortmund Ems Canal. An elastic rail is laid at the bottom of the canal, and the tugboat carries at its bottom four rollers which clasp the rail. These rollers are operated from the boat which is thus propelled. A large economy of power is claimed for this method. The experimental tug is worked by electricity, the energy being obtained through a cable from an auxiliary boat equipped with a dynamo. This, however, is only a provisional arrangement, and in ordinary working a trolly wire would be installed alongside the canal. Electrical operation can obviously be replaced by crude oil motors, etc., each barge being fitted with a set of rollers acting on the rail.

New Dock at Kure.—The construction of the large dock at Kure is nearing completion and the keel of a battleship of 31,000 tons displacement will soon be laid there. This is the largest warship yet planned.

New Ynchausti Steamer.—The "Governor Forbes" is the new name adopted for the "Admiral von Tirpitz," a steamer purchased from the Hamburg-America line by Messrs. Ynchausti & Co for the Philippine coastwise trade. She is a twin-screw steel steamer having accommodation for 60 first class passengers. She has been placed on the Manila-Iloilo run and is one of the finest equipped vessels in the service.

Siam Steam Navigation Co.—This company's profits for the half year amounted to Ticals 165.497 47 out of which 5[illegible],000 Ticals were written off for depreciation, 10,000 carried to special reserve and a dividend of 5% paid.

Advance in Shipping Rates.—The Nippon Yusen Kaisha, the P. O. S N. Co., the Hamburg-Amerika Linie, the Nord-Deutsche Steamship Co., the Pacc Mail Steamship Co., the Green Line, the Shire Line, the French Mail Steamship Co., and others interested in European traffic, recently held a conference and passed a resolution to raise the freightage on European lines by about 10 per cent. of the current rate. The decision will go into force in the middle of May. It is declared that the advance is absolutely due to the increased expenses in Europe.

The Hamburg-America Line.—This company's gross profits were £2,185.000, as against £1,995,000 in 1910. After deducting interest on debentures there remains £2,020,000 compared with £1,830,000 in 1910. The dividend will be increased from 8 to 9 per cent., and the balance of £1,450,000 is to be divided between depreciation, insurance, and reserve account. Owing to the continually increasing business and in view of new developments on the opening of the Panama Canal, the company has decided to increase its share capital by £1,250,000 bringing the amount of the capital up to 7½ millions sterling.

The company has laid down a third vessel of the 50.000-ton class. The Imperator, one of the sister ships which is already building, will be placed on the service between Southampton and New York in the spring of 1913. The other two, which are not yet named are to be ready a year later. These vessels will then be the largest ships afloat, exceeding the Olympic by 5,000 tons. Their speed will be twenty-one knots.

Japan's Naval Construction.—The following is a list of vessels at present under construction:

Battleships.—(e. d. c. = expected date of completion; d. l. = date of launch.)

Kawachi 20,800 tons; e. d. c. April 1912, d. l. October 1913.

Settsu 20,800 tons; e.d.c. June 1912, d.l. March 1911.

No. 3 (not yet named) 30,000 tons; e.d.c. between 1915 and 1916; d.l. not yet known.

First-Class Cruisers.—Kongo 27,500 tons; e. d.c. July 1913; d.l. November 1911.

Hiyei 27,500 tons; to be completed between 1914 1915; d.l. November 1911.

Haruna 27,500 tons; e.d.c. between 1916 and 1917; d.l. not yet known.

Kirishima 27.500 tons; e.d.c. between 1916 and 1917; d.l. not yet known.

Second-Class Cruisers.—Chikuma 4,950 tons; e.d.c. April 1912; d.l. April 1911.

Yahagi 4.950 tons; e.d.c. 1913 and 1914; d.l. October 1911.

Hirado 4.950 tons; e.d.c. between 1913 and 1914; d.l. June 1911.

Gunboat.—(Not yet named) 700 tons; e.d.c. 1912 and 1913, d.l. not yet known.

When these ships are added to the present naval strength, the Imperial Navy will have 73 units, of various sizes and descriptions, with a total tonnage of 647,150. Besides, there are two torpedo-boat destroyers, now under construction, of 1,200 tons each, and a submarine of 280 tons is also building.

MINES, MINERALS, THE METAL TRADE, MACHINERY, ETC.

F. M. S. Tin Export—The reports for January, 1912, show an export of 67,566.26 piculs valued at $6,355,282.64 (Straits Cur.) as against 64,333.10 piculs and a value of $5,997,131 57 for January, 1911, an increase in volume of 3,233.16 piculs and an increase in value of $358,150.85.

Raub Output.—The total for the four weeks ended February 24 was 1,000 ounces to which was added 430 ounces from annual clean-up.

Dungun Wolfram Syndicate.—A syndicate with capital of £40,000 has been organized for the purpose of developing deposits of wolfram involving an area of 3.000 acres in Trengganu, Malay peninsula. The prospectus sets forth that there are approximately 2,916 tons of wolfram in the deposits valued at £300,000.

The Hanyang-Pinghsien Corporation.—Reports have been in circulation for some time that an agreement had been signed between Chinese and Japanese capitalists to take over the Hanyang Iron Works and the Pinghsien coal mines. The authorized capital is said to be Taels 30,000,000 which covers all the obligations and new contributions necessary to continue the joint enterprise. Of the output of the mine the Japanese have been purchasing large amount of iron under a fifteen-year contract.

The Taya iron mines are situated about 67 miles below Hankow on the Yangtse and have an output of 1,000,000 tons of ore annually. A railway connects the mines with the river and water transportation is utilized to the works. The ore contains 62 3% iron and the works at Hanyang turn out 140,000 tons of pig iron and 70,000 tons of steel annually. The Pinghsien Colliery from which the supply is secured is in Kiangsi and is connected by railway with Chuchow. The output is 500,000 tons annually.

The first loan was raised in Germany on the iron mine and amounted to 3,000,000 taels. Development was under German management. Subsequently this loan was repaid and the Chinese assumed control. Sheng Huanhuai purchased control later and another loan of 3,000.000 taels was placed in Germany and the capital increased. Then Sheng soon secured control of the coal mines and the three concerns amalgamated.

In 1912 the Wakamatsu iron works entered into a contract with the company for its supply of iron and in 1904 advanced yen 3,000,000 which was later increased to 9,000,000. The revolutionaries drove Sheng into exile and placed an embargo on the property. It is now proposed by the new combination to pay the new government Tls. 5,000,000 to have the restraint removed.

There is thus 18,000,000 taels representing the old paid up capital of which 5,000,000 taels necessary to square the new government reduces the actual value to 13,000,000. The Chinese will add 2,000,000 making their share of the new syndicate 15,000,000. The Japanese capitalists propose undertaking the Japanese loan of 9,000,000, and will provide yen 5,000,000 to pay off the government embargo.

Ulu Piah Ltd.—The report for 1911 shows a profit on mining operations after payment of all mining costs and all administration expenses amount to $97,015.29. From this sum $15,000 was deducted for depreciation and $3,279.72 for managers' commission, leaving a net profit for the year of $78,735.57.

To this amount was added the sum of $3,039 70, the balance brought forward from last year after payment of directors' fees, making a total of $81,775.27 available for distribution.

Interim dividends amounting to $60,000 have already been paid, and the Directors recommend that the balance amounting to $21,775 27 be dealt with as follows:—

Place to the Credit of General Reserve Account.........	$10,000.00
Payment of Final Dividend of 20% (making 170% for the year).	8,000 00
Payment of Directors' Fees.........	2,500.00
Carry forward to next Account......	1,275.27
Total	$21,775.27

Japanese Pig Iron Production.—The latest statistics on pig iron production in Japan place the annual amount at 70,000 tons in 1910 with an importation of 117,227 tons.

Radium in Japan.—Yohachiro Okamoto contributes an article in the Journal of the Geological Society of Tokyo on investigations made with radio-active minerals in a hot spring in Taiwan where the phenomena was first discovered in 1908.

Indian Mining Industry.—Consul General W. H. Michael of Calcutta writes that there were 635 mining concessions granted by the Government during the year 1910, against 693 in 1909. The decrease was doubtless due to the fact that only six mining leases were taken out for chromite in Baluchistan, as compared with 76 in 1909.

The production of petroleum was confined principally to Burma and amounted to 214,829,647 gallons in 1910, compared with 233,678,087 in 1909. The imports of kerosene declined from 70,514,379 gallons in 1909 to 57,359,905 gallons in 1910.

The production of manganese ore in India increased from 642,675 tons, valued at $1,819,540, in 1909, to 800,907 tons, valued at $4,145,275 in 1910. The principal mining of maganese ore during the year was done in the Central Provinces.

The production of the ruby mines of Mogok in 1910 was 260,019 carats, valued at about $520,000. This was an increase in weight of 4,715 carats over the previous year but of only $1,000 in value. The number of laborers in the ruby mine during the year on the per diem roll was 1,463.

The gold production of India during 1910 amounted to 573,119 ounces, as compared with 574,816 ounces in 1909, the value each year being about $11,000,000.

There was a falling off in the outturn of diamonds, which are found mainly in Central India. Total quantity obtained in 1910 was only 77.74 carats, valued at $2,950, as against 147.355 carats, valued at $5,445 in 1909. It is apparent that diamond mining in India at the present time amounts to very little, and it is predicted that as a business it will cease altogether within a short time unless some large company undertakes the development of the mines in Central India. This will require a tremendous outlay for building roads to make the mines accessible. There is no doubt that very rich diamond fields exist in India, but in such out-of-the-way places and so difficult and dangerous of access that they are not workable by individuals of small means.

FINANCIAL, COMMERCIAL AND MISCELLANEOUS.

Formosan Tea Trade.—Some statistics given by Consul General C. Reat of Tamsui, Formosa, after the close of the season Nov. 15, 1911.

"Although there are about 16,000 pounds to come down from the country districts, only two or three firms are waiting for these deliveries. The island's total production will reach 25,000,000 pounds, an increase of nearly 3,000,000 pounds over 1910. The total production of Oolong teas will be 21,000,000, leaving 4,000,000 pounds for Powchong teas.

The total export of Oolong teas will be 20,862,450 pounds, of which 9,246,933 pounds goes to America via the Pacific and 10,551,207 pounds via Suez; to England 870,012 pounds, and to other countries 194.312 pounds. The total export in 1910 was 17,980,000 pounds, of which 17,055,000 pounds went to America.

The season opened early this year, and from the beginning to the close high prices prevailed. The higher grades, which were somewhat scarce, averaged nearly $1 a picul (133⅓ pounds) over last year, while the medium grades ran from 50 to 75 cents over last season's prices. Despite the increase in production the standard grade was quoted from $1.25 to $1.50 per picul over the quotations of 1910.

The Powchong teas, highly scented with jasmine flower, are manufactured mainly for native consumption in China, Straits Settlements, and the Philippines. A small quantity goes to the United States.

The Hongkong & Shanghai Banking Corporation.—The net profits for half-year ending 31st December, 1911, including $2,038,774.39 balance brought forward from last account, after paying all charges, deducting interest paid and due, and making provision for bad and doubtful accounts, amount to $4,880,494.70.

After deducting Remuneration to Directors there remains for appropriation $4,865,494.70, out of which the Directors recommend the payment of a Dividend of Two Pounds Sterling per Share, viz.: £240,000, and a Bonus of Five Shillings Sterling per Share, viz.: £30,000, amounting in all to £270,000 which at 1/10¼, the rate of the day, will absorb $2,912,356.55.

The Balance $1,953,135 15 to be carried to New Profit and Loss Account.

The holding of £1,200,000 2½% Consols has been written down from £948,000 to £924 000 and now stands in books at 77; the adjustment being effected by the addition to other Sterling Securities of £25,000 Indian Railway Debentures bought at about par but written down to £24,000. The cost was met out of the earnings of the half-year.

Formosan Sugar Industry.—The production of sugar for 1911-12 is estimated at 230 000 tons. A 500-ton mill constructed for the Taihoku Seito Kaisha was completed in December. This installation was made by Dyer & Co of Cleveland, Ohio. The Taihoku Seito Kaisha operates in Northern Formosa and is capitalized at $1,500,000.

Philippine Circulation.—The report of the Philippine Treasury for February announces a circulation of ₱55,793,859.26 of which ₱30.425.551 are silver certificates, ₱13 659 777 in silver pesos, ₱5,739,576 in subsidiary silver, and ₱911,548 in minor coins.

AMERICAN FOREIGN STEEL TRADE.

The recent suits filed by the United States Government against the United States Steel Corporation, the Sandard Oil Company, and the Harvester Company are in sad contrast to the attitude of the governments of England and Germany towards their manufacturers. The American companies referred to, in export activity, represented the sale abroad of $171,000,000 worth of American manufacturers in 1910. Had this export record been to the credit of an English or German corporation their respective governments would have sought high and low for some means of emphasizing their appreciation and accordingly greater encouragement. The *New York Sun* takes occasion to direct attention to the discouraging attitude of the United States Government towards those corporations that are putting forth every effort to build up a substantial market abroad for American manufactures.

"Last year," says the *Sun*, "the Steel Corporation sold $60,000,000 worth of goods abroad, the Standard Oil Company sold $71,000 000 worth, the Harvester company sold $40,000,000 worth.

"This $171,000,000 was poured into our laps, so to speak, by foreign buyers and was distributed among workingmen, clerks and the vast army of men who had to do with the production of the goods, as well as among the stockholders of the corporations. Big busines produced these results because it had the capital and the facilities for building up foreign trade. Small concerns cannot compete for this business.

In ten months of the current year the country's exports have increased $235,000,000 according to recently published Government statistics. At the same time imports have decreased owing to slack business in this country, so that for the ten months of this year the United States has a credit of $401,000,000 in the known balance of trade.

"Prior to the organization of the United States Steel Corporation a few of the several companies now its subsidiaries had secured export trade to a limited extent. They did not maintain an export organization and could not compete on a satisfactory basis with the Germans, English and Belgians, who had operated for many years through highly systematized organizations. It is obvious that it is impossible for ten or twenty comparatively small companies to obtain a large share of the word's export business, as from the standpoint of expense alone it would not be feasible for each to maintain foreign offices in the principal markets of the world.

"It is generally understood that export business can only be secured on a paying basis by the maintenance of branch offices in the principal consuming markets of the world to exploit the peculiar merits of each individual product and supply the merchants and importers with information and prices; for instance, the United States Steel Corporation's export organization has found it necessary to have representatives in sixty foreign countries.

"Among other reasons for the formation of the United States Steel Corporation was the recognition of the difficulties and expense of obtaining export business by any other means than by enabling an individual or foreign office to offer for sale the diversified products of a number of mills; this could only be done by integrated organization. Foreign business in steel products is understood to be conducted along well defined lines in various groups of materials; for instance, some buyers specialize in wire, sheets, tin plate and pipe; others in railway and engineering lines, &c.; again, many large firms deal in all steel products and prefer to buy from one manufacturer. The necessity of one selling organization, to offer a comprehensive line of diversified steel products to foreign buyers in the manner to which they have been accustommed by foreign organizations, such as the Stahlwerks-Verband of Germany, was patent to the organizers of the United States Steel Corporation.

"The Stahlwerks-Verband, or German Steel Works Union, through its control of the sales of steel products of all of the principal German mills, was able to build up its export trade enormously, so that it is now exporting at the rate of 6,000,000 tons a year, valued at about $200,000 000.

"The export trade of the world prior to the organization of the United States Steel Corporation and its subsidiary export company was obtained almost in its entirety by the manufacturers of Germany, Belgium and Great Britain, working generally in accord in their respective countrites or controlled by respective national selling organizations. The organization in Germany, for instance, would out of its general funds frequently allow subventions to manufacturers to enable them to take export orders at less than cost if they could not otherwise compete. This has always been considered necessary from their standpoint on account of the fluctuations of the iron and steel industry.

"If there were no export trade, domestic prices must necessarily be increased to a point which will enable the mills to operate, in view of the fact that their labor is paid such meagre wages that it is impossible to effect reductions that would materially affect their costs.

"The Steel Corporation's export organization was completed the latter part of 1903, and since January 1, 1904, it has shipped to foreign countries goods valued at over $335,000,000. The annual sums comprising this aggregate have been a large factor in the maintenance of a 'favorable balance of trade,' which, despite the usual arguments of theoretical economists, is generally conceded as being essential for the welfare of the United States in meeting its large foreign obligations and expenditures.

"The steel export business is now running at the rate of about $60,000,000, and while it still falls far short of the enormous volume of export business of England or Germany it appears to be at least maintaining the hold that it has secured after years of uphill work in competition with the older export organizations of Europe. The amount of steel shipped over seas or to nearby foreign markets during the period mentioned is over 9,000,000 tons.

"Before the organization of the Steel Corporation it was generally recognized that there was not sufficient export business in heavy products from the United States to justify the frequent and permanent operation of suitable freight carrying steamers from American ports to the many outlying ports of the world. The situation has materially changed. The present shipping facilities, at least from the eastern part of the United States, to all of the principal markets of the world are entirely adequate to the business offered. Additional steamship lines and steamers have been yearly put into service to satisfy the growing export trade. Due to the larger tonnage offered in steel and kindred products and other export materials the freight rates compare favorably with those from European ports, and these shipping facilities combined with reasonable freight rates have enabled American manufacturers to engage in the export trade and to annually increase their participation.

"The Steel Corporation's export organization is of course only one of the manufacturers that have built up their export trade, the International Harvester Company, for instance, having increased its foreign trade during the last ten years until it now amounts to about $40,000,000 annually.

"Said a representative of the Steel Corporation yesterday:

"'Whether it is of benefit to the people of the United States generally to obtain approximately $200,000,000 a year in steel and harvesting materials and the sale of petroleum products, aside from millions of dollars in other materials from other buyers, these sums enabling the operation of mills which would otherwise be idle; the payment of wages to labor, by reason of the larger scale of mill operations, which would otherwise be impossible; the maintenance through the continuous operation of mills of prices to domestic consumers which have generally been reasonable and remarkably low in comparison with prices quoted in other manufacturing countries; the employment of many hundreds of additional steamers from American ports to every market in the world these questions would seem to admit of only one answer.

"'The average number of employees of the United States Steel Corporation during 1910 was 218, 435, with total annual salary and wages of $174,955,139. The volume of business done by all of the subsidiary companies of the corporation during 1910 amounted to 11,337,879 tons domestic and 1,223,496 export, the latter representing practically 10 per cent of the total. If applied theoretically to the number of employees it would seem that without the export trade 21,843 men would not have been employed and $17,495,513, which would ordinarily have been paid to them as wages, would have been lost to the merchants and manufacturers of this country.

"'Had not export business been secured it would have meant the shutting down of a number of mills that are now engaged exclusively in the export trade and the consequent demoralization of whole communities and bankruptcy of thousands of individuals dependent on such mills. It would of necessity have increased the cost of manufacture enormously, rendering imperative increased cost to domestic consumers. A general reduction of 10 per cent in the working force of the mills of the corporation would have reflected disastrously in the earning and spending power of the communities surrounding the mills, and the sociological results arising from such increase of unemployed would have been sufficiiently evil to have engaged the attention of political economists.

"'It is also of interest to consider that this 9,000,000 tons of material exported during the last eight years has paid to American railroads something over $20,000,000 in freights. The outcry in some quarters against the building up of export trade by American manufacturers is difficult to understand by those who appreciate that this country is yearly consuming more of its farm products and must ultimately rely almost entirely on exporting its manufactures to become any factor in the world's trade. Nevertheless it is frequently asked why export prices are generally lower than domestic. If those who ask the question could also supply the answer to the question of how American manufacturers are to compete with foreign manufacturers without meeting their prices it would reflect more favorably on the mentality of those who decry the practice of lower export prices, while insisting that the manufacturers of the United States should become prominent factors in the world's markets.

"'The comparatively onerous conditions, from the standpoint of profits prevailing in this country, in many lines of manufacture, such as the higher wages which are necessary to pay to labor as against those which are paid abroad, and the encouragement to business enterprise on a large scale which is generally extended in foreign countries, have already induced a number of American manufacturers to build plants in foreign countries. It is to be hoped that this practice will not be forced on the Steel Corporation. It is true that the increasing costs of manufacture in this country compared with the low costs abroad have made it increasingly difficult to compete with foreign manufacturers with any appreciable degree of profit, and it is in recognition of this fact, as well as the facilities which are offered abroad to manufacturers by way of higher duties, low labor cost, subsidies, subventions, low freights and government and municipal encouragement, that many manufacturers in this country are to-day considering whether they should build or acquire plants abroad for their export trade.

"'The Steel Corporation has suffered under many handicaps in order to retain and maintain its plants in this country. It has, however, always heretofore taken the position that it should produce in the United States as long as it possibly can consistent with the encouragement and opportunity offered to manufacturers here for export trade in order to employ American labor and distribute its earnings to American stockholders, who in a large measure would be affected directly or indirectly by any abandonment or transfer of its plants to foreign countries.'

'The United States Government is suing to dissolve the United States Steel Corporation."

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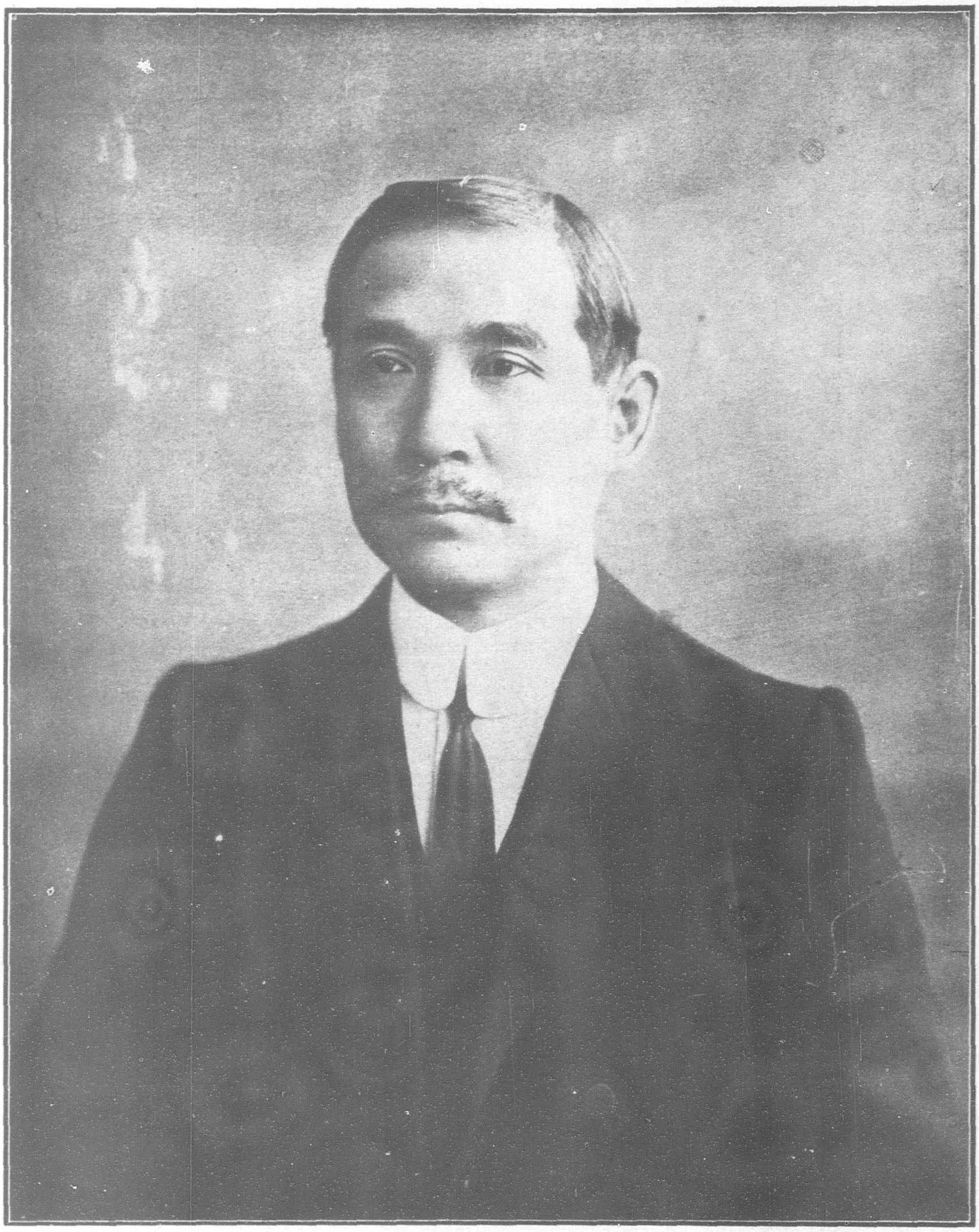

Dr. SUN YAT-SEN,
First Provisional President of the Republic of China.

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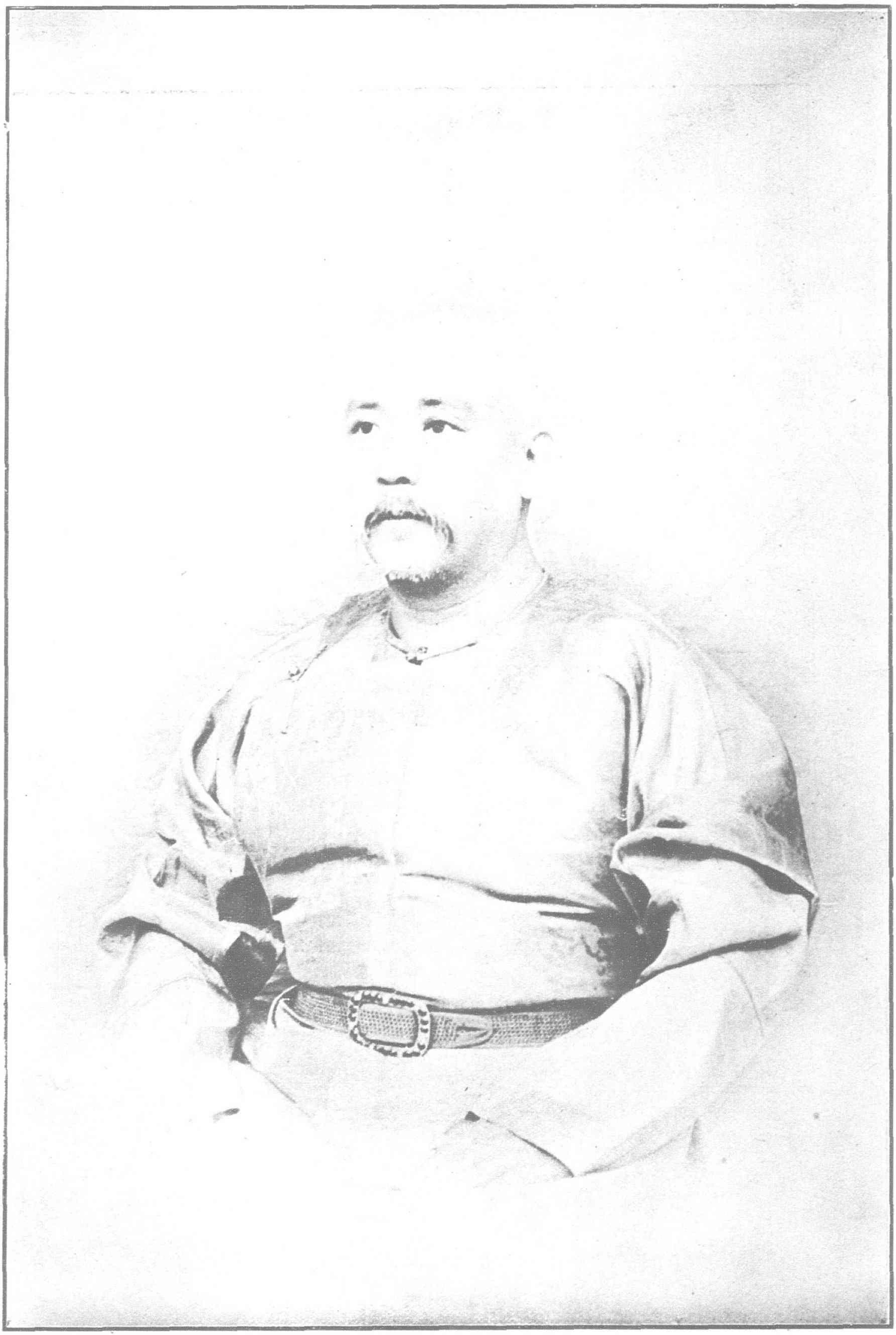

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